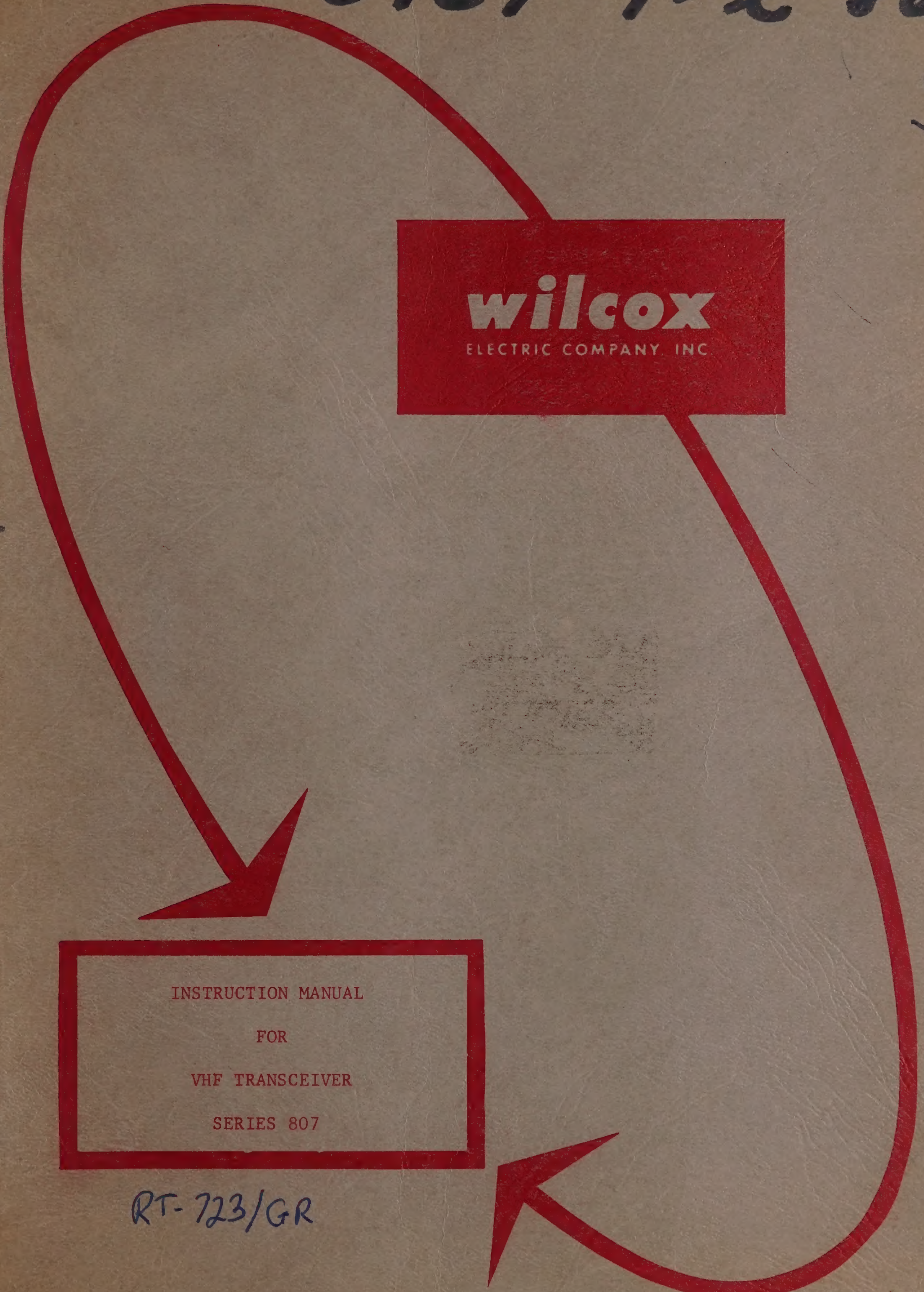
0967-192-8010

TL 2 6703

6703



wilcox
ELECTRIC COMPANY, INC

INSTRUCTION MANUAL
FOR
VHF TRANSCEIVER
SERIES 807

RT-723/GR

ADDENDUM 1 TO INSTRUCTION MANUAL
FOR VHF TRANSCEIVER SERIES 807

This addendum supplements the basic instruction manual by referencing additional documentation which covers Transceiver 807.

Insert this addendum in the manual following the front cover.

NAVSHIPS XXXX-XXX-XXXX, Technical Manual for Radio Set RT-723/GR, provides information for operation of VHF Trnasceiver 807 with Radio Set Type 97723-100. Transceiver 807 is designated Type 97607-100 when used in this configuration.

TECHNICAL MANUAL REVISION SERVICE

* * * * *

Revisions to this Technical Manual, if any, will be found at the rear of the manual following the schematic diagrams.

-- Wilcox Electric Company, Inc.

EQUIPMENT
SERIAL NO.

INSTRUCTION MANUAL NO. 104957-300

WILCOX ELECTRIC COMPANY, INC.
1400 CHESTNUT ST.
KANSAS CITY 27, MISSOURI, U.S.A.

VHF TRANSCEIVER SERIES 807

EQUIPMENT CERTIFIED BY FAA TSO NUMBERS C37b AND C38b
FOR ENVIRONMENTAL CATEGORY AAAAAAX CLASS I.

- WARRANTY -

Wilcox Electric Company, Inc. warrants all equipment manufactured by it to be free from defect in material and workmanship, provided the equipment is operated under normal ratings and service for which it was intended. The obligation of the company shall be limited to making good at its factory, or at an authorized repair and service facility of Wilcox, any part or parts, exclusive of vacuum tubes and transistors, thereof which shall by its inspection and test, be found defective, providing these parts are returned prepaid to the company within one (1) year after delivery to the original purchaser.

Vacuum tubes and transistors will be replaced for a period of ninety days if returned to the factory prepaid with validating support claims.

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TABLE OF CONTENTS

Section		Page
I	INTRODUCTION	1-1
	General	1-1
	Purpose of Equipment	1-1
	Description	1-1
	Transistor, Tube, and Tunnel Diode Complement	1-3
	Technical Characteristics	1-6
II	INSTALLATION	2-1
	General	2-1
	Inspection	2-1
	Bench Test and Adjustment	2-1
	System Installation	2-1
	Interconnect Aircraft Wiring	2-8
III	OPERATION	3-1
	General	3-1
	Operating Procedure	3-1
IV	THEORY OF OPERATION	4-1
	General	4-1
	General Transceiver Theory	4-1
	Receiver Theory	4-1
	Frequency Conversion Circuitry	4-5
	Channel Selection Circuits	4-14
	Transmitter Theory	4-22
	Frequency Conversion Circuits	4-24
	Channel Selection Circuits	4-30
	Power Supply and Control Circuit Theory	4-34
V	PREVENTIVE AND CORRECTIVE MAINTENANCE	5-1
	General	5-1
	Preventive Maintenance	5-1
	Corrective Maintenance	5-3
	Test Equipment Required	5-3
VI	PARTS LIST Not included	6-1
VII	DIAGRAMS	7-1

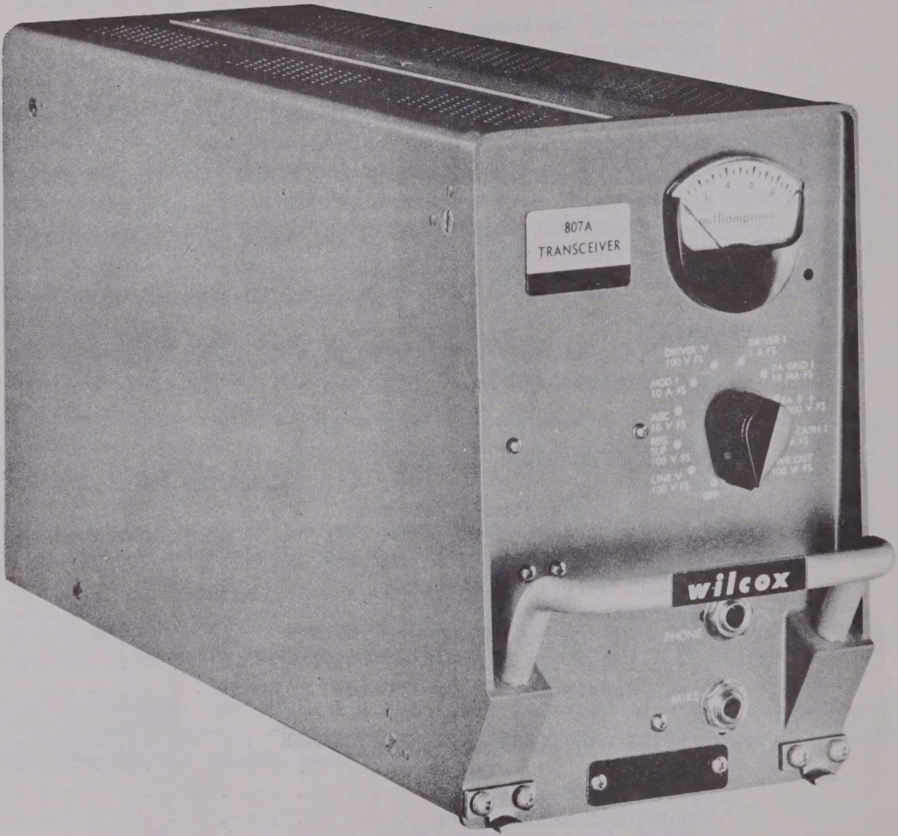

807A
TRANSCEIVER
milliamperes
DRIVER V
100 V FS
DRIVER I
1 A FS
PA GRID I
10 MA FS
MOD I
10 A FS
AGC
15 V FS
REG
SUP
100 V FS
LINE V
100 V FS
OFF
CATH I
A FS
RF OUT
100 W FS
wilcox
PHONE
MIKE

Figure 1-1. VHF Transceiver Series 807

SECTION I

INTRODUCTION

1-1. GENERAL.

1-2. SCOPE OF MANUAL. This instruction manual contains information concerning the physical, mechanical, and electrical characteristics of the Wilcox Series 807 VHF Transceiver, Type 97607-100, and includes data necessary for installation, operation, and maintenance of the unit.

1-3. PURPOSE OF EQUIPMENT. The Series 807 VHF Transceiver, shown in figure 1-1, is an airborne unit designed to transmit and receive voice communications in the frequency range of 116.000 to 149.975 mc. In addition, when used with auxiliary equipment, the transceiver is capable of transmitting and receiving communications intelligence for an air traffic control signaling system (ATCSS). Table 1-1 lists the associated equipment required for use with the transceiver in a typical installation.

1-4. ASSOCIATED EQUIPMENT PUBLICATIONS. Table 1-2 lists other Wilcox publications covering the equipment required for use with the transceiver.

1-5. DESCRIPTION.

1-6. The transceiver, shown in figure 1-1, is packaged in a full-height, half-width, short-length ATR case and weighs approximately 15.9 pounds (7.22 kg). Physical size of the unit, excluding front panel, is 12.56 inches (31.91 cm) long, 7.62 inches (19.36 cm) high, and 4.88 inches (12.39 cm) wide. Two aluminum side covers completely enclose the equipment and are easily removed by releasing quick-action fasteners which secure each cover. Unit construction is of aluminum and is divided into five basic sections: front panel, bottom deck, receiver chassis, center chassis, and rear panel. Screws with self-locking nuts are used to join the sections together to insure a rigid frame.

1-7. Mounted on the front panel are a rotary switch and a meter for the selection and monitoring of voltages and currents at various points in the unit, two jacks, designated MIKE and PHONE, two hold-down hooks, and a standard front panel handle. All electrical connections to the unit are made through a dual connector on the rear panel, which is a formed heat sink with mounting facilities for three transistors.

1-8. Components and circuitry located on the receiver chassis are as follows: the switching matrix, all frequency synthesizing circuits, bandpass filters, and the receiver circuits. The receiver chassis extends the full length of the unit at the left side and is attached to the rear panel by hinges and to the front panel and center chassis by quick-release fasteners. When the fasteners are released, the receiver chassis swings out from the side of the unit to provide access to the backside of its chassis and to the left side of the center chassis.

1-9. Components and circuitry located on the left side of the center chassis are as follows: a subassembly containing transmitter excitation circuits, a transient suppression transistor, filtering components, and the high-voltage subassembly. Components and circuitry located on the right side of the center chassis are as follows: a subassembly containing two stages of rf drive, a tube type power amplifier,

TABLE 1-1. EQUIPMENT REQUIRED

EQUIPMENT	WILCOX PART NUMBER	DESCRIPTION	FUNCTION
Radio Set Control (See figure 1-2)	97650-100	Dual communication/navigation frequency control unit using digital binary control system.	Selects operating frequency.
Shockmount as specified in ARINC Characteristic No. 546.			Shockmounting for Transceiver.
VHF Antenna as specified in ARINC Characteristic No. 546.			Receives and radiates vhf communications signals.
Headset		500-ohm impedance.	Audio output.
Microphone		100-ohm impedance.	Audio input.

TABLE 1-2. ASSOCIATED EQUIPMENT PUBLICATIONS

PUBLICATION	TECHNICAL MANUAL NUMBER
Instruction manual for Radio Set Control Type 97650-100.	T. O. 12R2-4-69-1 (Wilcox P/N 104925-300)

a blower for cooling, and a positioning motor; two transistors (modulator driver/amplifiers); and two printed circuit boards, mounted one behind the other. The printed circuit boards are hinged at the bottom and are secured at the top by means of quick-release fasteners. Components and circuitry located on the boards are as follows: modulator input amplifiers, sidetone amplifiers, transient suppression circuits, and the power and motor control circuits. Power transformers and associated filtering components are mounted on the bottom deck.

1-10. Transistors are employed in all transceiver circuits except for the tube used in the power output stage of the transmitter. Extensive use is made of printed circuit techniques in the equipment design and all small signal transistors are of the plug-in type. Terminations are available for use as test points in all essential circuits to permit investigation of significant voltages and waveforms. All alignment adjustments and test points are readily accessible and can be easily located.

The unit is designed to utilize cooling techniques as specified in ARINC Specification No. 404 and the over-all design and construction of the unit is in accordance with the requirements of ARINC Characteristic No. 546.

1-11. TRANSISTOR, TUBE, AND TUNNEL DIODE COMPLEMENT.

1-12. Table 1-3 lists the transistor, tube, and tunnel diode complement of the Series 807 VHF Transceiver.

TABLE 1-3. TRANSISTOR, TUBE, AND TUNNEL DIODE COMPLEMENT

Reference Designation	Type	Function
Receiver		
CR302	1N3712	Squelch Control
*Q101	2N3282	RF Amplifier/3rd Injection Mixer
Q102	2N3282	1st Mixer
Q103	2N1195	2nd Mixer
Q104	2N1195	3rd Mixer
*Q105	2N3282	Frequency Doubler
*Q106	2N3282	1st Injection Mixer
*Q107	2N2398	Injection Amplifier
Q108	2N1195	2nd Injection Mixer
Q201	2N1195	I-F Amplifier
Q202	2N697	I-F Amplifier
Q203	2N697	I-F Amplifier
Q204	2N1132	AGC Amplifier
Q205	2N697	AGC Amplifier
Q301	2N697	Selcal/ATCSS Amplifier
Q302	2N1143	Squelch Amplifier
Q303	2N338	Audio Amplifier
Q304	2N338	Audio Amplifier
Q305	2N697	Audio Amplifier

*Denotes transistors used in both the receiver and transmitter.

TABLE 1-3 (CONT). TRANSISTOR, TUBE, AND TUNNEL DIODE COMPLEMENT

Reference Designation	Type	Function
	Receiver (Cont)	
Q306	2N1132	Audio Amplifier
*Q401	2N1195	High Unit's Oscillator
*Q402	2N1195	Low Unit's Oscillator
*Q501	2N1195	Ten's Oscillator
Q601	2N1195	Tenth's MC Oscillator
Q701	2N1195	Hundredth's MC Oscillator
Q801	2N1195	3.045-MC Oscillator
*Q901	2N697	30's Switch
*Q902	2N697	20's Switch
*Q903	2N697	10's Switch
*Q904	2N697	Unit's Amplifier
*Q905	2N698	+50-Volt DC Converter
	Transmitter	
Q109	2N2398	2nd Injection Mixer
Q110	2N2398	RF Amplifier
Q602	2N1195	Tenth's MC Oscillator
Q702	2N1195	Hundredth's MC Oscillator
Q1001	2N1195	RF Exciter Amplifier
Q1002	2N2951	RF Exciter Amplifier
Q1003	2N3118	RF Exciter Amplifier
Q1004	2N2218	RF Exciter Amplifier
Q1101	2N2950	RF Driver/Amplifier
Q1102	2N2876	RF Driver/Amplifier

*Denotes transistors used in both the receiver and transmitter.

TABLE 1-3 (CONT). TRANSISTOR, TUBE, AND TUNNEL DIODE COMPLEMENT

Reference Designation	Type	Function
	Transmitter (Cont)	
Q1401	2N338	Sidetone Amplifier
Q1402	2N338	Sidetone Amplifier
Q1403	2N697	Sidetone Amplifier
Q1404	2N1132	Sidetone Amplifier
Q1501	2N697	Preamplifier
Q1502	2N697	Preamplifier
Q1503	2N697	Audio Driver
Q1601	2N697	Modulator Driver/Amplifier
Q1602	2N697	Modulator Driver/Amplifier
Q1603	2N1489	Modulator
Q1604	2N1489	Modulator
*Q1701	2N398A	Transient Suppressor
*Q1702	2N1560	Transient Suppressor
*Q1703	2N2567	Transient Suppressor
*Q1704	2N2156	+20 Volt DC Regulator
*Q1705	2N1132	+20 Vold DC Regulator
*Q1706	2N1613	+20 Volt DC Regulator
Q1801	2N1552	Power Inverter
Q1802	2N1552	Power Inverter
*Q1901	2N697	Low Unit's Logic Switch
*Q1902	2N697	High Unit's Logic Switch
Q1903	2N697	Push-to-Talk Switch
V1201	8121	Power Amplifier

*Denotes transistors used in both the receiver and transmitter.

1-13. TECHNICAL CHARACTERISTICS.

1-14. Technical characteristics applicable to the Series 807 VHF Transceiver are as follows:

OVER-ALL EQUIPMENT

Power input --	+27.5 volts dc +10 -20%, 10 amperes max.
Power consumption:	
Receive --	2.0 amperes.
Transmit --	7.5 amperes.
Frequency range --	116.000 to 149.975 mc.
Channels:	
Number --	1360
Spacing --	25 kc.
Channeling time --	Less than 4 seconds.
Frequency selection --	Digital binary (2-out-of-5 wire) system described in ARINC Characteristic No. 410.
Environmental requirements:	
Temperature:	
Continuous operation --	-54 deg. C (-65 deg. F) to +55 deg. C (131 deg. F).
Short-time --	-54 deg. C (-65 deg. F) to +71 deg. C (160 deg. F).
Power disconnected --	-62 deg. C (-79.6 deg. F) to +70 deg. C (160 deg. F).
Humidity --	95 to 100% maximum at 50 deg. C (122 deg. F) for 48 hours.
Altitude --	45000 ft. max.
Vibration:	
Shockmounted --	0.030 inch constant excursion from 10 to 55 cps with maximum 5g. Constant acceleration of 5g from 55 to 500 cps.

Rigid mounted -- 0.020 inch constant excursion from 5 to 37 cps with maximum 3g. Constant acceleration of 1.5g from 37 to 500 cps.

Shock -- 6g operating, 15g impact.

RECEIVER

Input impedance -- 52 ohms, coaxial.

Sensitivity -- A maximum signal of 3 (hard) microvolts, modulated 30% at 1000 cps, is required to achieve 6 db signal plus noise-to-noise ratio.

Selectivity:

Normal -- ±15 kc wide (min) at 6 db down; ±31.5 kc wide (max) at 60 db down.

Sharp (With Optional Filter, Wilcox No. 44266-2) -- ±6 kc wide (min) at 6 db down; ±18.5 kc wide (max) at 60 db down.

All spurious responses -- At least 60 db down.

Audio output impedance:

Receiver -- 500 ohms nominal; accommodates output loads from 200 ohms to infinity.

Sidetone -- 500 ohms nominal; accommodates output loads from 200 ohms to infinity.

ATCSS -- 100 ohms.

Audio output:

Receiver -- 100 milliwatts into an external 200- or 500-ohm resistive load for a 3-microvolt input signal, modulated 30% at 1000 cps.

Sidetone -- 100 milliwatts into an external 200- or 500-ohm resistive load for 100% modulation.

ATCSS -- 0.50 volts into an open circuit for a 1000 microvolt input signal, modulated 30% at 1000 cps.

Audio distortion -- Less than 7.5% at normal rated output for a signal modulated 30% at 1000 cps.

Audio response --	Less than 6 db total variation from 300 to 3750 cps.
AGC --	Receiver output will not vary more than 3 db over the range of signal input levels from 5 to 100,000 microvolts and not more than 6 db over the range of signal input levels from 5 to 500,000 microvolts.
Squelch threshold --	3 microvolts or less; internally and externally adjustable.

TRANSMITTER

Power output:	
Minimum --	25 watts.
Maximum --	50 watts.
Output impedance --	52 ohms.
Frequency stability --	Better than 0.005%.
Type of emission --	A3, A0.
Type of modulation --	Amplitude, high level.
Modulation system --	Internal modulator capable of modulating the transmitter 100% with a voltage of 0.25 rms at 100 cps applied to a 100-ohm input circuit. Over-all distortion will not exceed 10% at 100% modulation at 1000 cycles. Audio system flat within 6 db from 300 to 3000 cps.
Audio input impedance:	
Mike input --	100 ohms.
ATCSS input --	100 ohms.
0 dbm input --	500 ohms, ct.
Audio input:	
Mike input --	0.25 v, 1000 cps.
ATCSS input --	1.0 v, 1000 cps.
0 dbm input --	1 mw, 1000 cps.

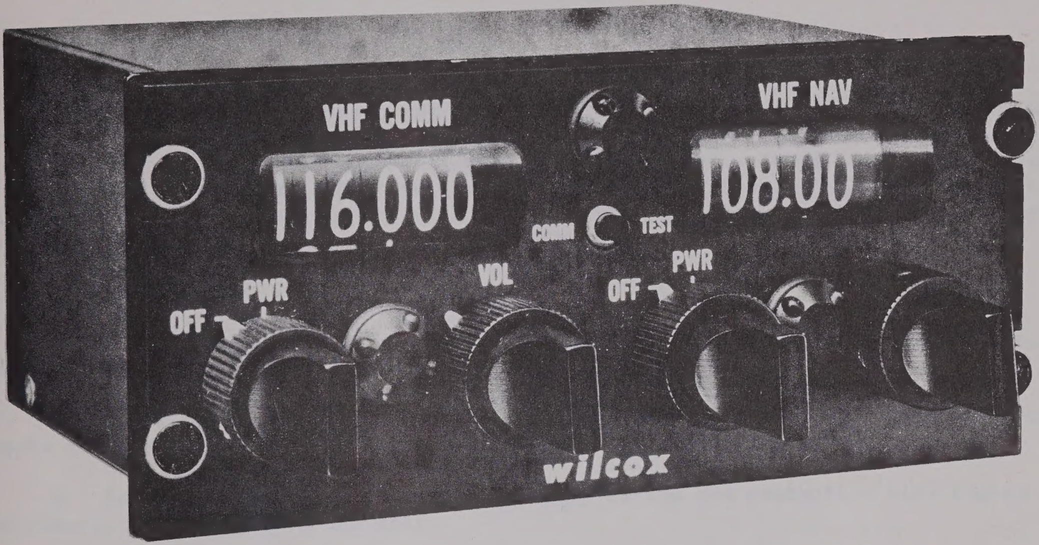

VHF COMM
116.000
VHF NAV
108.00
COMM
TEST
PWR
OFF
VOL
PWR
OFF
wilcox

Figure 1-2. Radio Set Control Type 97650-100

SECTION II

INSTALLATION

2-1. GENERAL.

2-2. This section contains information required to install the Series 807 VHF Transceiver and associated equipment in an aircraft. Information included covers inspection, bench test, adjustment, installation, and final test. Installation procedures given for the transceiver and associated equipment apply to a typical aircraft installation and should be supplemented with specific information usually included in the manufacturer's manual for the aircraft in which the transceiver is to be installed.

2-3. INSPECTION.

2-4. Prior to performing subsequent test, adjustment, and installation procedures, make a visual inspection of the transceiver as follows:

a. Check unit exterior for possible damage incurred in shipment such as dents, cracks and scratches, broken components, broken connector pins, etc.

b. Release quarter-turn fasteners on each of the two protective side covers and remove the covers from the unit.

c. Refer to figures 2-1, 2-3, and 2-4, remove retaining screws from the receiver chassis, 3.045 oscillator and rf shield covers, and remove the covers.

d. Release the four fasteners securing the receiver chassis at the front and top edges and swing chassis outward on attached hinges.

e. Release fasteners securing the two 'hinged' printed circuit boards on the right side of the center chassis and lower boards as shown in figure 2-4.

f. Refer to figures 2-1 through 2-6 and check the transceiver to determine that all plug-in transistors and crystals are properly seated in their respective sockets.

2-5. BENCH TEST AND ADJUSTMENT.

2-6. The transceiver is shipped from the factory in proper working order and normally should not require an operational check prior to installation in the aircraft. If an operational check is desired, perform the preliminary test procedures given in paragraph 5-14.

2-7. DATA LEVEL control R301, AUDIO LEVEL control R308, SIDETONE LEVEL control R1401 and IF GAIN control R201 are adjusted at the factory for output settings as listed in Table 2-1. If the factory output settings for these controls are not suitable for a given installation, adjust the controls for the required outputs as described in Section V of this manual.

2-8. SYSTEM INSTALLATION.

2-9. The procedures outlined in subsequent paragraphs cover the installation of the Series 807 VHF Transceiver and associated equipment as a communications system in the

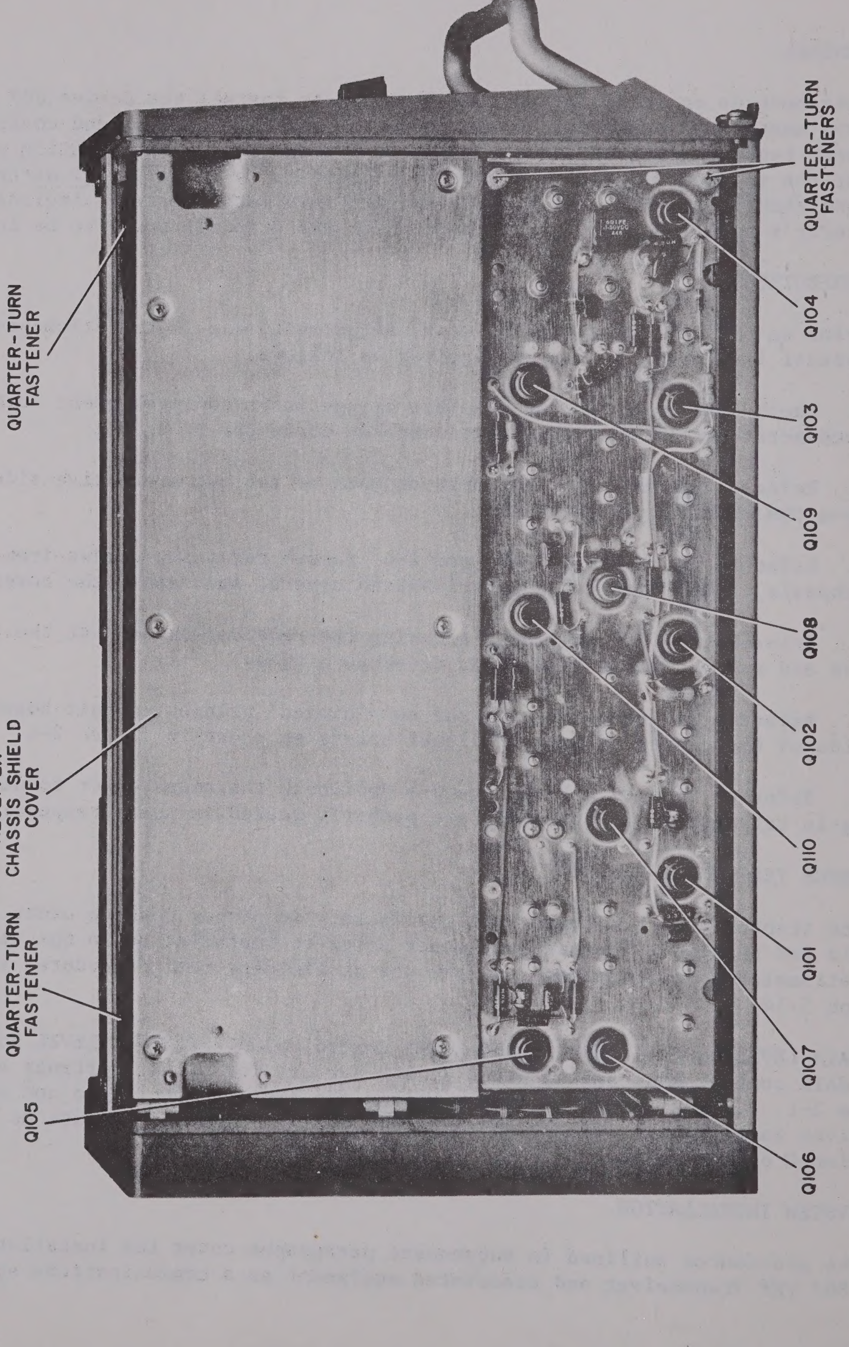

QUARTER-TURN FASTENER
RECEIVER CHASSIS SHIELD COVER
QUARTER-TURN FASTENER
Q105
QUARTER-TURN FASTENERS
Q104
Q103
Q109
Q108
Q102
Q110
Q101
Q107
Q106

Figure 2-1. VHF Transceiver Series 807, Transistor Locations

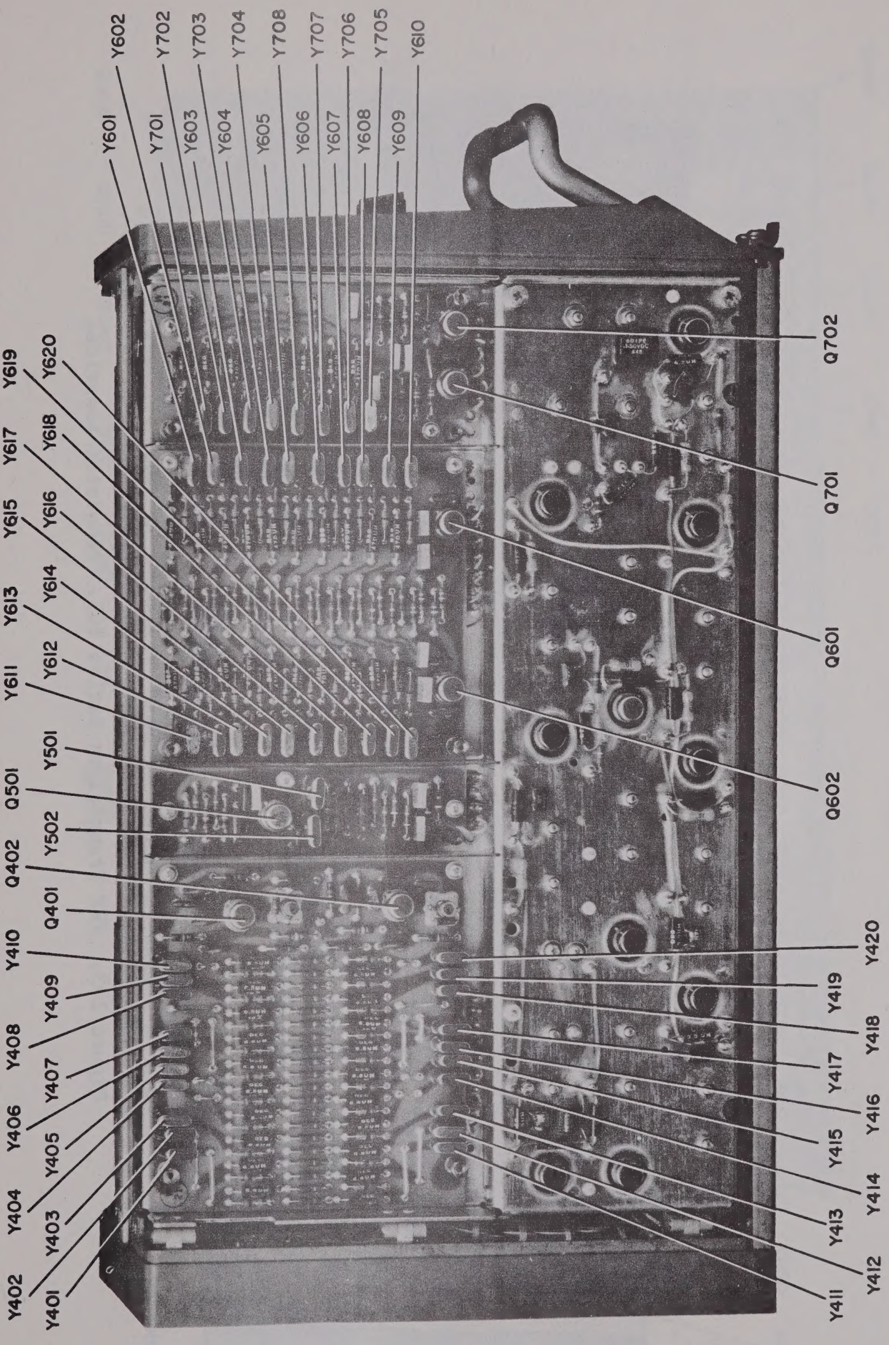

Y601
Y602
Y701
Y702
Y603
Y703
Y604
Y704
Y605
Y708
Y606
Y707
Y607
Y706
Y608
Y705
Y609
Y610
Y619
Y620
Y617
Y618
Y615
Y616
Y613
Y614
Y611
Y612
Y501
Q501
Y502
Q402
Q401
Y410
Y409
Y408
Y407
Y406
Y405
Y404
Y403
Y402
Y401
Q702
Q701
Q601
Q602
Y420
Y419
Y418
Y417
Y416
Y415
Y414
Y413
Y412
Y411

Figure 2-2. VHF Transceiver Series 807, Transistor and Crystal Locations

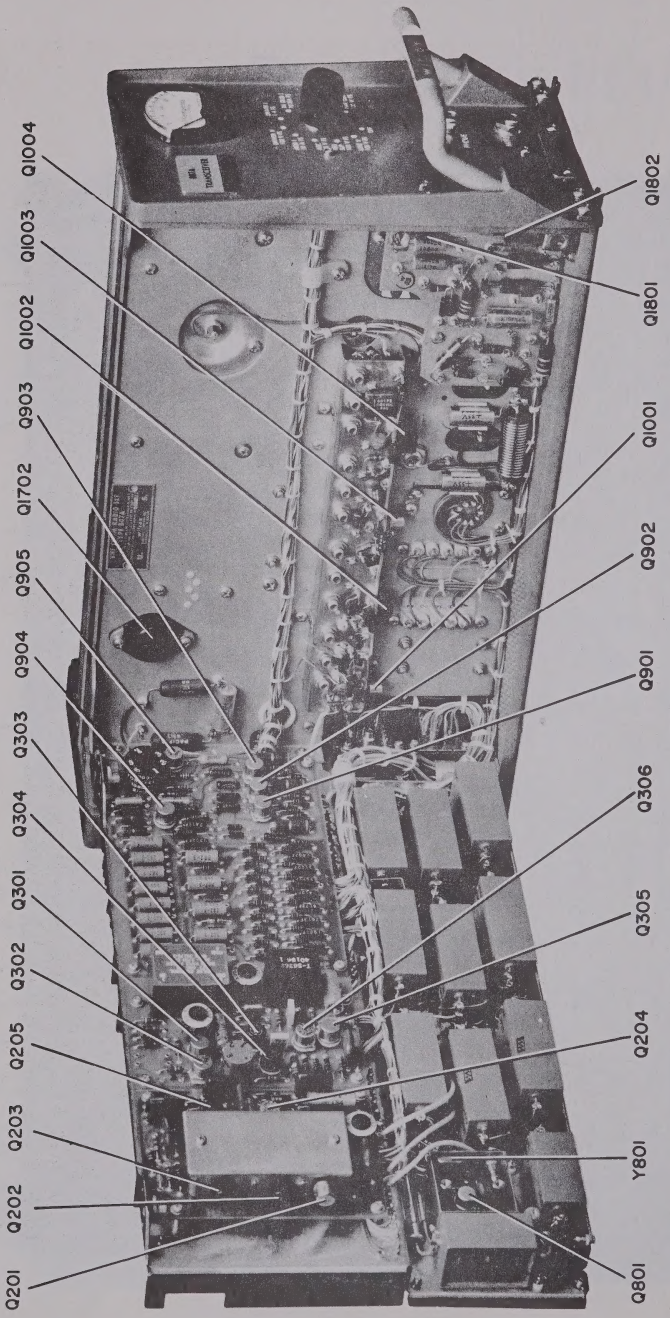

Q1004
Q1003
Q1002
Q903
Q1702
Q905
Q904
Q303
Q304
Q301
Q302
Q205
Q203
Q202
Q201
Q1802
Q1801
Q1001
Q902
Q901
Q306
Q305
Q204
Y801
Q801

Figure 2-3. VHF Transceiver Series 807, Transistor Locations

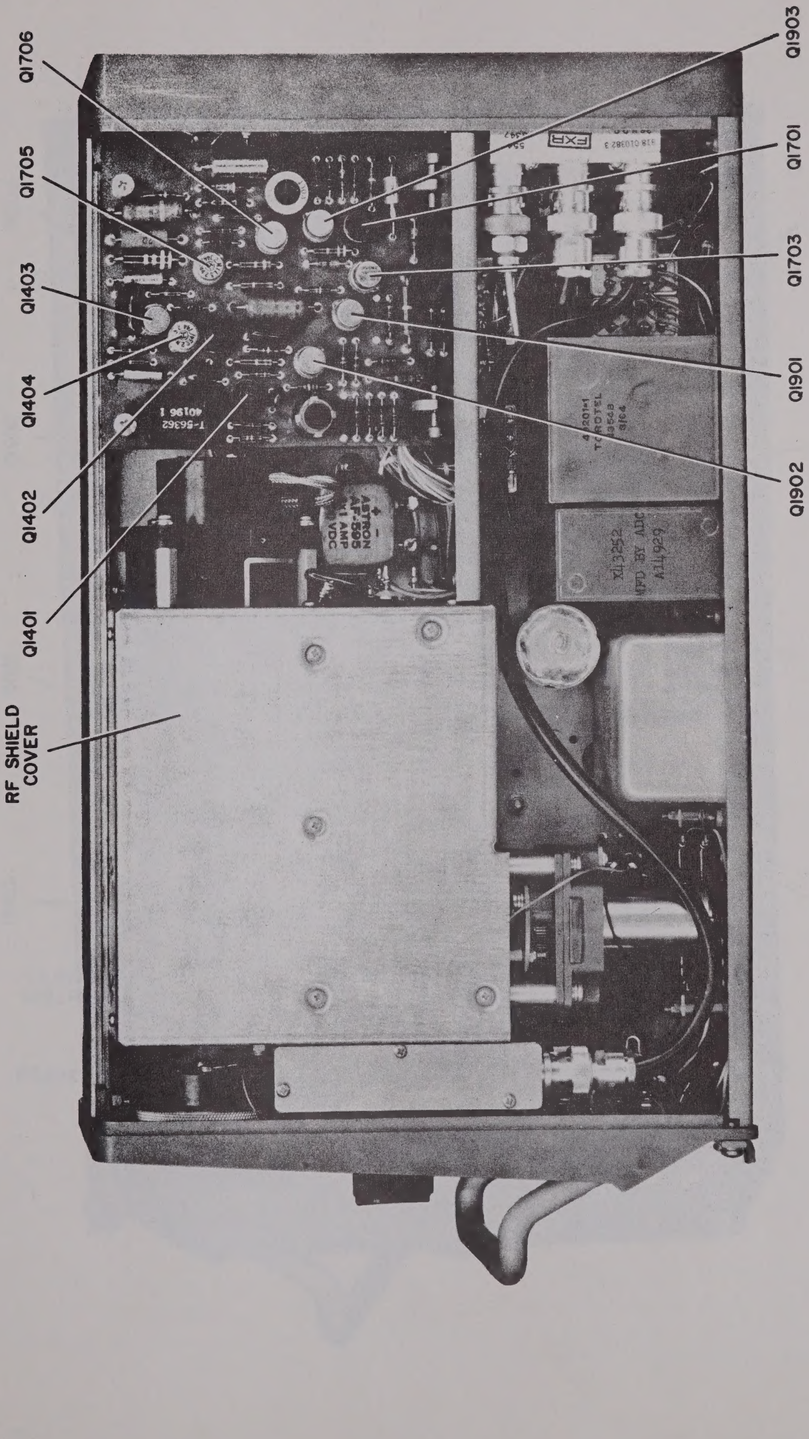

Q1706
Q1705
Q1403
Q1404
Q1402
Q1401
RF SHIELD COVER
Q1903
Q1701
Q1703
Q1901
Q1902

Figure 2-4. VHF Transceiver Series 807, Transistor Locations

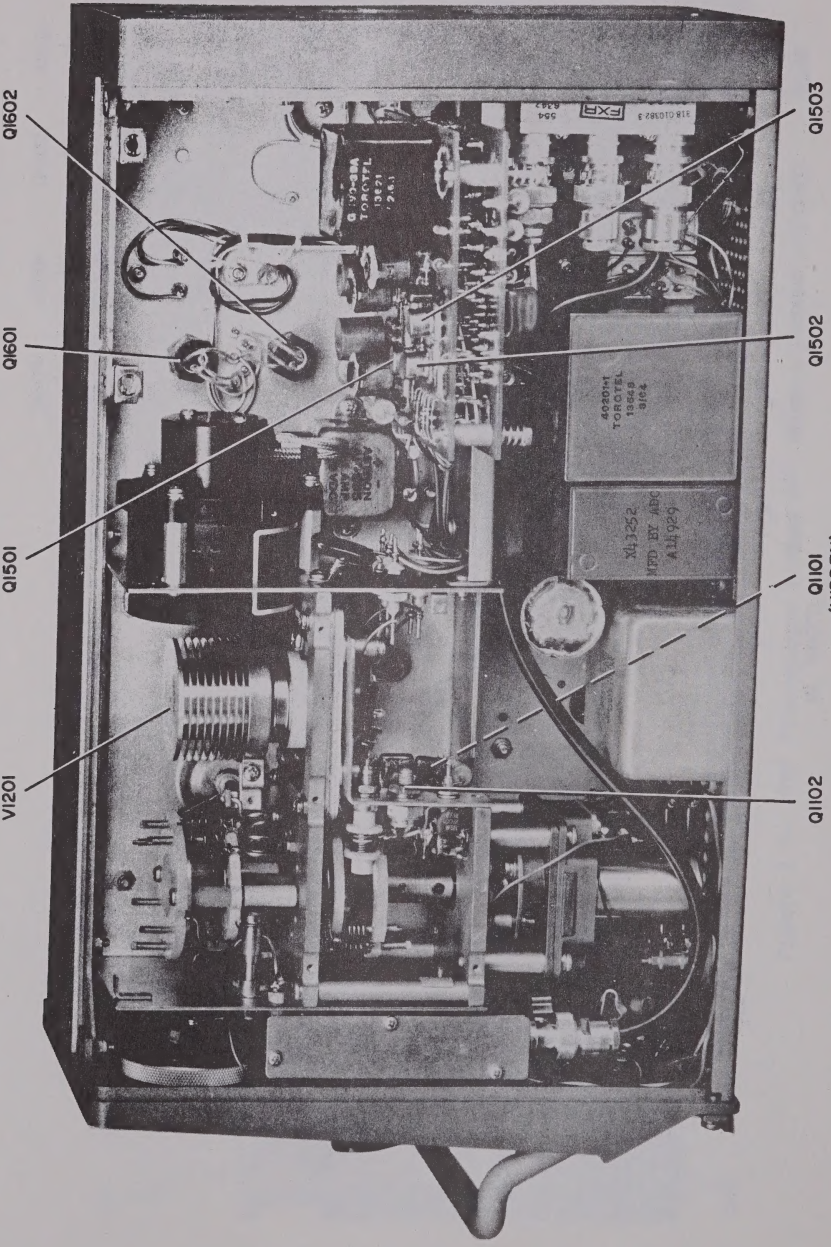

Q1602
Q1601
Q1501
V1201
Q1503
Q1502
Q1101
(HIDDEN)
Q1102

Figure 2-5. VHF Transceiver Series 807, Transistor Locations

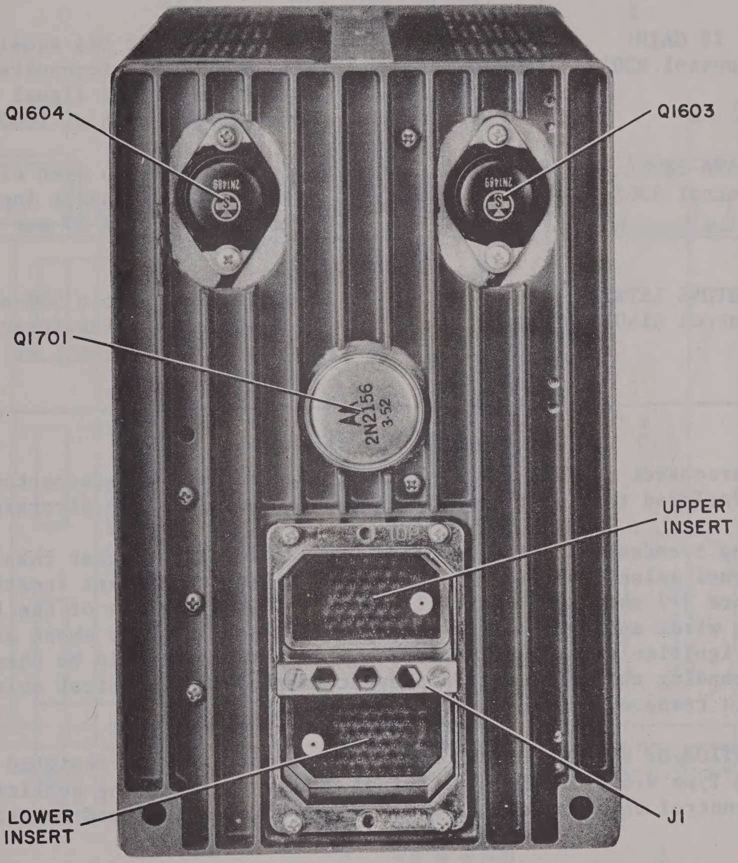

Q1604
Q1603
Q1701
UPPER INSERT
LOWER INSERT
J1
2N1489
2N1489
2N2156
3-52

Figure 2-6. VHF Transceiver Series 807, Transistor Locations

TABLE 2-1. FACTORY CONTROL SETTINGS

CONTROL	SETTING
AUDIO LEVEL control R308	100 milliwatts into a 500-ohm load with a 3-microvolt input signal, modulated 90 per cent at 1000 cps.
IF GAIN control R201	Adjusted so that the squelch will open at 3 microvolts or less for an input signal modulated 90 per cent at 1000 cps.
DATA LEVEL control R301	0.25 volts into an open circuit with a 1000-microvolt input signal, modulated 30 per cent at 1000 cps.
SIDETONE LEVEL control R1401	25 milliwatts into a 500-ohm load when the transmitter is modulated 90 per cent at 1000 cps.

aircraft. Interconnect cabling and systems wiring diagrams and connector data information are included to aid in connecting the equipment in the aircraft.

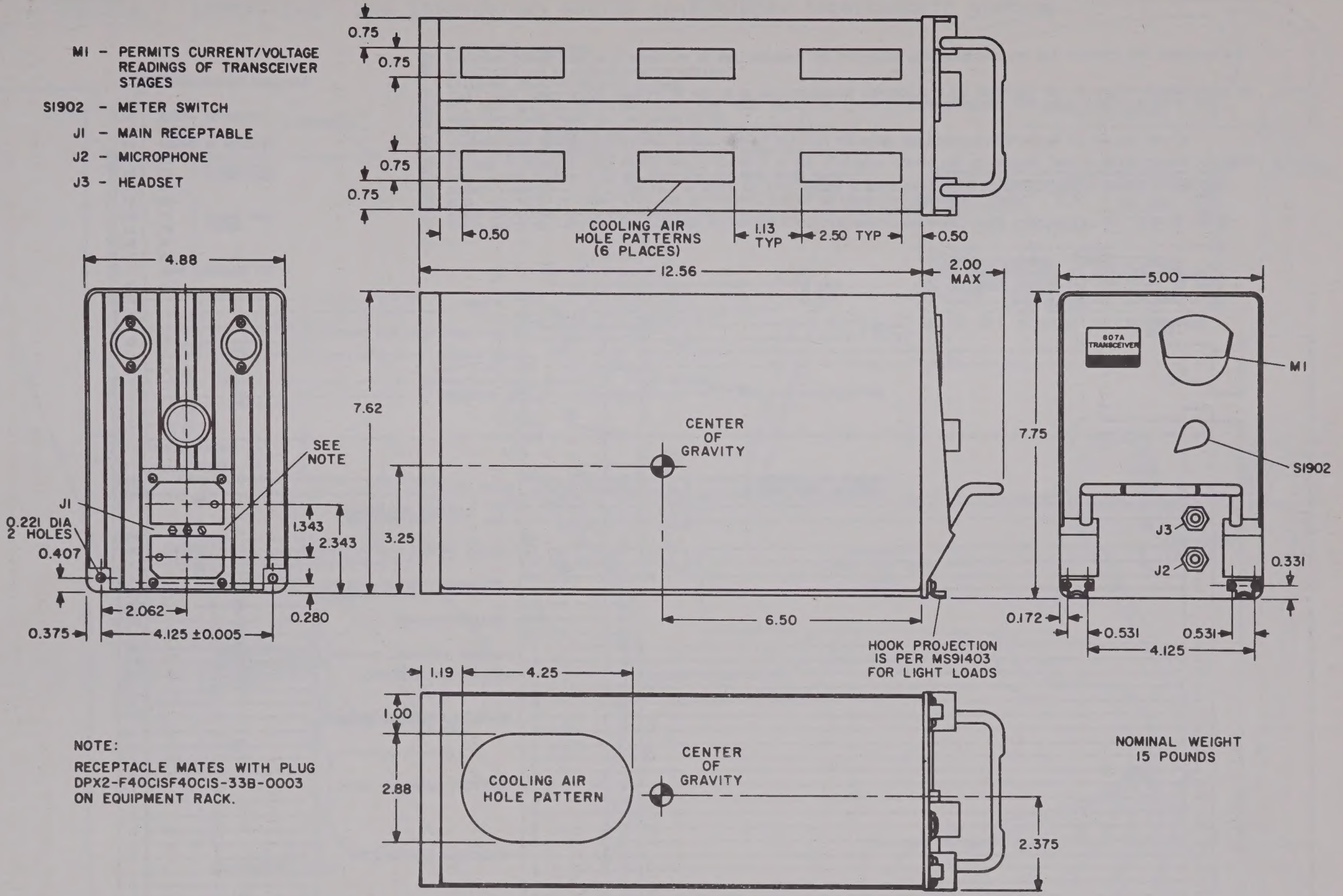
2-10. Since the transceiver requires no adjustment in flight other than remote switching (channel selection), it may be mounted in any convenient location in the aircraft. Figure 2-7 shows the over-all and mounting dimensions of the transceiver. Interconnecting wires and antenna transmission line should be as short as possible. The aircraft's ignition system, generator, and accessories should be checked for the necessary bonding and shielding to prevent extraneous electrical noises from interfering with transceiver operation.

2-11. INSTALLATION OF REMOTE CONTROL UNIT. The transceiver is designed to be used with the Wilcox Type 97650-100 Remote Control Unit. Refer to the publication designated for the control unit in Table 1-2 to obtain unit outline and mounting information.

2-12. INSTALLATION OF ANTENNA. A vhf communication antenna, as specified in ARINC Characteristic 546, is available from several different manufacturers. Install the antenna as recommended by the manufacturer.

2-13. INSTALLATION OF EQUIPMENT RACK. The transceiver is mounted in an equipment rack or shock-mounted shelf as specified in ARINC Characteristic 546. Install the equipment rack or shock-mounted shelf as recommended by the rack or shelf manufacturer.

2-14. INTERCONNECT AIRCRAFT WIRING. The system schematic diagram shown in figure 2-8 illustrates the interwiring between the transceiver, associated equipment, and the aircraft wiring. Figure 2-9 is a cording diagram of a typical transceiver installation and a connector data sheet is shown in Table 2-2.

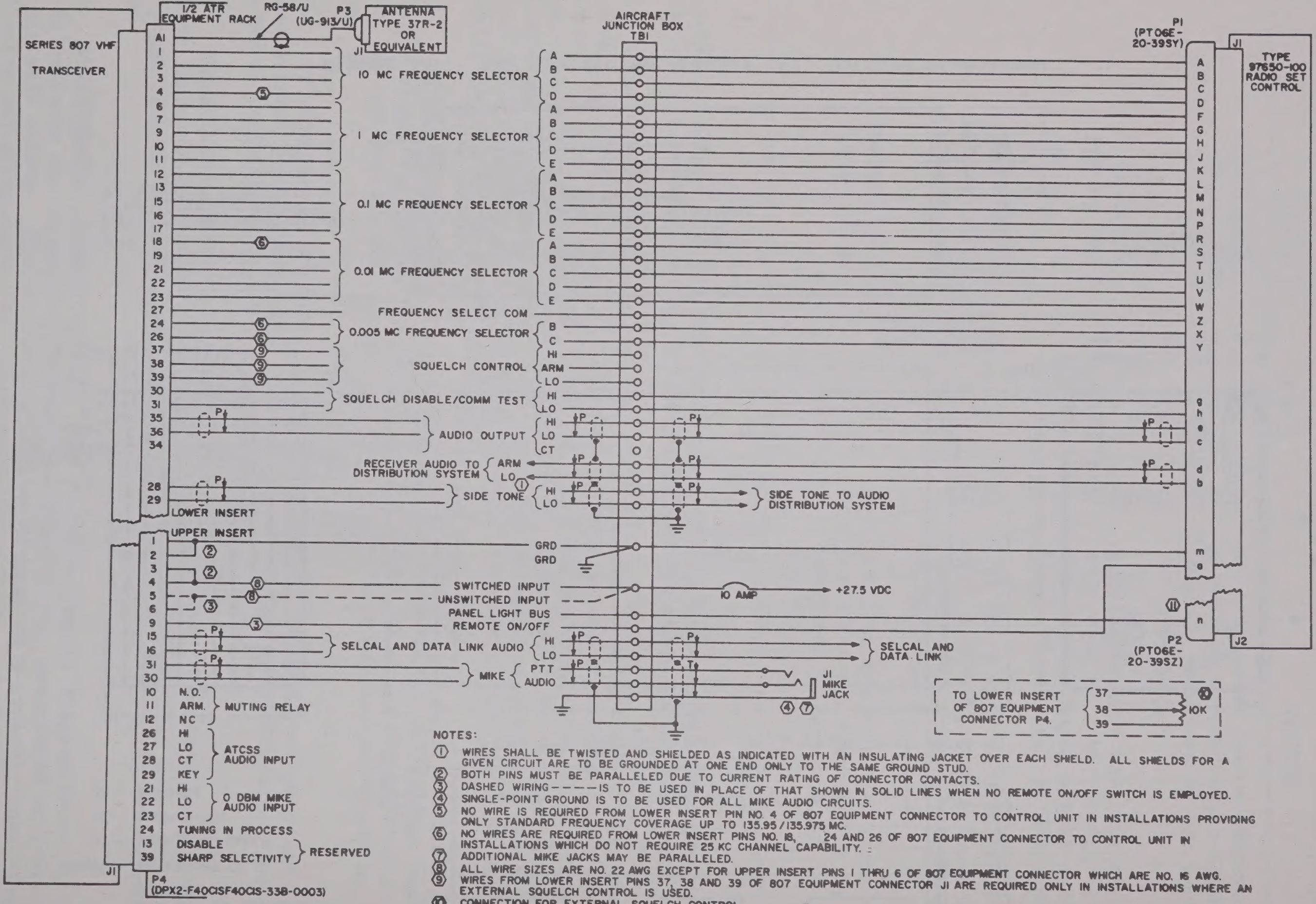

0.75
0.75
0.75
0.75
0.50
COOLING AIR HOLE PATTERNS (6 PLACES)
1.13 TYP
2.50 TYP
0.50
12.56
2.00 MAX
4.88
7.62
SEE NOTE
J1
0.221 DIA 2 HOLES
0.407
1.343
2.343
3.25
0.280
2.062
0.375
4.125 ±0.005
CENTER OF GRAVITY
6.50
HOOK PROJECTION IS PER MS91403 FOR LIGHT LOADS
5.00
807A TRANSCEIVER
M1
7.75
S1902
J3
J2
0.331
0.172
0.531
0.531
4.125
1.19
4.25
1.00
2.88
COOLING AIR HOLE PATTERN
CENTER OF GRAVITY
2.375

M1 - PERMITS CURRENT/VOLTAGE READINGS OF TRANSCEIVER STAGES
S1902 - METER SWITCH
J1 - MAIN RECEPTABLE
J2 - MICROPHONE
J3 - HEADSET

NOTE:
RECEPTACLE MATES WITH PLUG DPX2-F40CISF40CIS-33B-0003 ON EQUIPMENT RACK.

NOMINAL WEIGHT
15 POUNDS

Figure 2-7. VHF Transceiver Series 807, Outline Dimensions


SERIES 807 VHF TRANSCEIVER
1/2 ATR EQUIPMENT RACK
RG-58/U
P3 (UG-913/U)
ANTENNA TYPE 37R-2 OR EQUIVALENT
J1
A1
10 MC FREQUENCY SELECTOR
1 MC FREQUENCY SELECTOR
0.1 MC FREQUENCY SELECTOR
0.01 MC FREQUENCY SELECTOR
FREQUENCY SELECT COM
0.005 MC FREQUENCY SELECTOR
SQUELCH CONTROL
SQUELCH DISABLE/COMM TEST
AUDIO OUTPUT
RECEIVER AUDIO TO DISTRIBUTION SYSTEM
SIDE TONE
LOWER INSERT
UPPER INSERT
GRD
SWITCHED INPUT
UNSWITCHED INPUT
PANEL LIGHT BUS
REMOTE ON/OFF
SELCAL AND DATA LINK AUDIO
MIKE
PTT
AUDIO
N.O.
ARM.
NC
MUTING RELAY
HI
LO
CT
KEY
ATCSS AUDIO INPUT
0 DBM MIKE AUDIO INPUT
TUNING IN PROCESS
DISABLE
SHARP SELECTIVITY
RESERVED
P4 (DPX2-F40CISF40CIS-338-0003)
AIRCRAFT JUNCTION BOX TB1
10 AMP
+27.5 VDC
SIDE TONE TO AUDIO DISTRIBUTION SYSTEM
SELCAL AND DATA LINK
J1 MIKE JACK
P1 (PT06E-20-39SY)
P2 (PT06E-20-39SZ)
J1
J2
TYPE 97650-100 RADIO SET CONTROL
TO LOWER INSERT OF 807 EQUIPMENT CONNECTOR P4.
37
38
39
10K

NOTES:

① WIRES SHALL BE TWISTED AND SHIELDED AS INDICATED WITH AN INSULATING JACKET OVER EACH SHIELD. ALL SHIELDS FOR A GIVEN CIRCUIT ARE TO BE GROUNDED AT ONE END ONLY TO THE SAME GROUND STUD.
② BOTH PINS MUST BE PARALLELED DUE TO CURRENT RATING OF CONNECTOR CONTACTS.
③ DASHED WIRING – – – – IS TO BE USED IN PLACE OF THAT SHOWN IN SOLID LINES WHEN NO REMOTE ON/OFF SWITCH IS EMPLOYED.
④ SINGLE-POINT GROUND IS TO BE USED FOR ALL MIKE AUDIO CIRCUITS.
⑤ NO WIRE IS REQUIRED FROM LOWER INSERT PIN NO. 4 OF 807 EQUIPMENT CONNECTOR TO CONTROL UNIT IN INSTALLATIONS PROVIDING ONLY STANDARD FREQUENCY COVERAGE UP TO 135.95/135.975 MC.
⑥ NO WIRES ARE REQUIRED FROM LOWER INSERT PINS NO. 18, 24 AND 26 OF 807 EQUIPMENT CONNECTOR TO CONTROL UNIT IN INSTALLATIONS WHICH DO NOT REQUIRE 25 KC CHANNEL CAPABILITY.
⑦ ADDITIONAL MIKE JACKS MAY BE PARALLELED.
⑧ ALL WIRE SIZES ARE NO. 22 AWG EXCEPT FOR UPPER INSERT PINS 1 THRU 6 OF 807 EQUIPMENT CONNECTOR WHICH ARE NO. 16 AWG.
⑨ WIRES FROM LOWER INSERT PINS 37, 38 AND 39 OF 807 EQUIPMENT CONNECTOR J1 ARE REQUIRED ONLY IN INSTALLATIONS WHERE AN EXTERNAL SQUELCH CONTROL IS USED.
⑩ CONNECTION FOR EXTERNAL SQUELCH CONTROL.
⑪ REMAINING CONNECTIONS NOT SHOWN ON P2 ARE ASSIGNED FOR NAVIGATION FUNCTIONS AND ARE NOT REQUIRED FOR OPERATION OF WILCOX 807 EQUIPMENT.

Figure 2-8. VHF Transceiver Series 807, System Interconnect Diagram

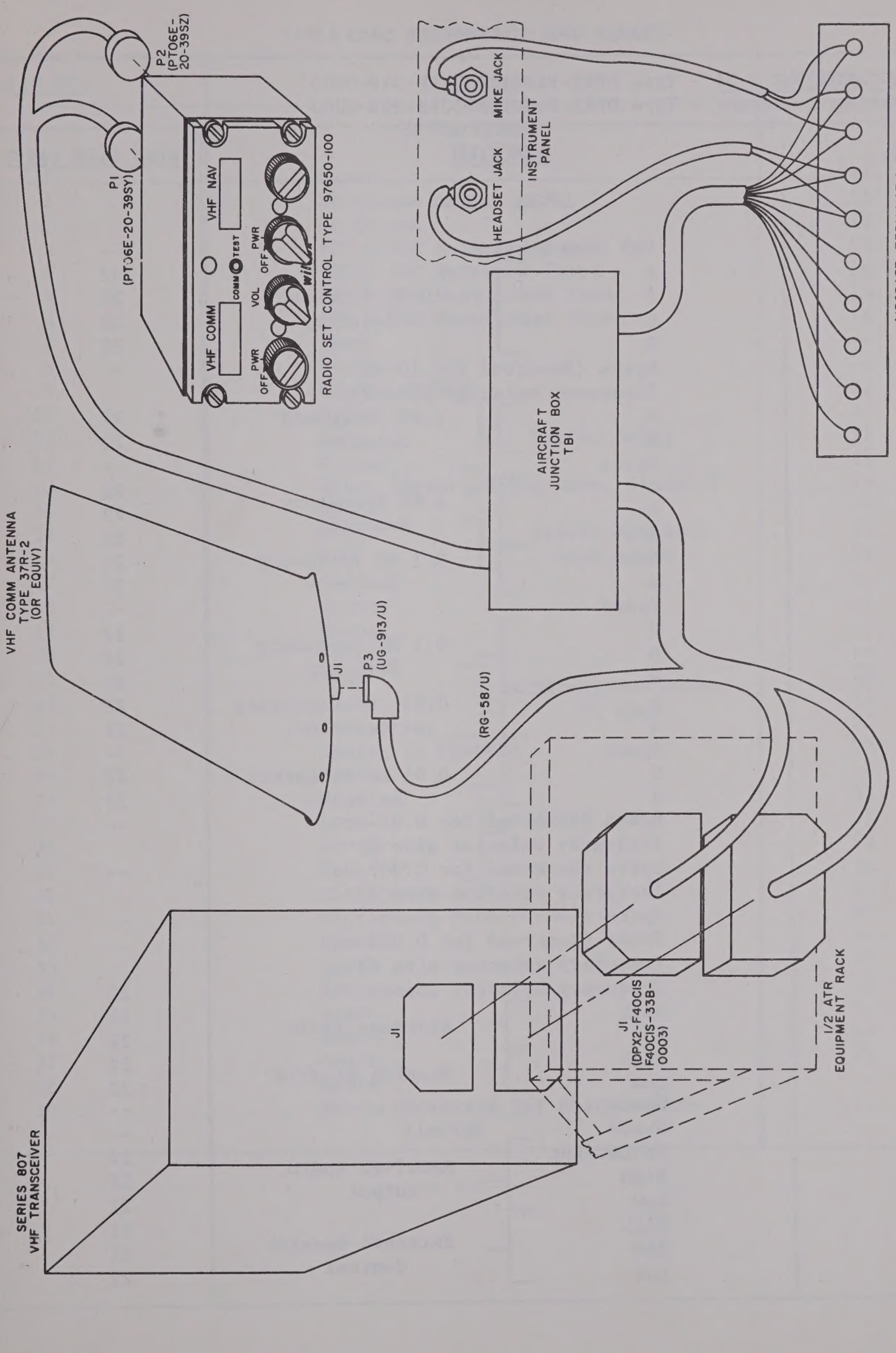

P2
(PT06E-
20-39SZ)
P1
(PT06E-20-39SY)
VHF COMM
VHF NAV
COMM
TEST
PWR
OFF
VOL
RADIO SET CONTROL TYPE 97650-100
HEADSET JACK
MIKE JACK
INSTRUMENT
PANEL
AIRCRAFT TERMINATIONS
AIRCRAFT
JUNCTION BOX
TBI
VHF COMM ANTENNA
TYPE 37R-2
(OR EQUIV)
J1
P3
(UG-913/U)
(RG-58/U)
J1
(DPX2-F40CIS
F40CIS-33B-
0003)
1/2 ATR
EQUIPMENT RACK
J1
SERIES 807
VHF TRANSCEIVER

Figure 2-9. VHF Transceiver Series 807, Cording Diagram

TABLE 2-2. CONNECTOR DATA

REAR CONNECTOR - J1 - Type DPX2-F40C1PF40C1P-34B-0003
Mating Connector - Type DPX2-F40C1SF40C1S-33B-0003

PIN NO.	FUNCTION		WIRE SIZE (AWG)
	LOWER INSERT		
A1	VHF Comm Antenna		--
1	A	10 MC Frequency Selector	22
2	B		22
3	C		22
4	D		22
5	Spare (Reserved for 10-mc frequency selector wire E)		--
6	A	1 MC Frequency Selector	22
7	B		22
8	Spare		--
9	C	1 MC Frequency Selector	22
10	D		22
11	E		22
12	A	0.1 MC Frequency Selector	22
13	B		22
14	Spare		--
15	C	0.1 MC Frequency Selector	22
16	D		22
17	E		22
18	A	0.01 MC Frequency Selector	22
19	B		22
20	Spare		--
21	C	0.01 MC Frequency Selector	22
22	D		22
23	Spare (Reserved for 0.01-mc frequency selector wire E)		--
24	Spare (Reserved for 0.005-mc frequency selector wire B)		--
25	Spare		--
26	Spare (Reserved for 0.005-mc frequency selector wire C)		--
27	Frequency Selector Common		22
28	High	Sidetone Audio	22
29	Low		22
30	High	Squelch Disable	22
31	Low		22
32	Spare		--
33	Spare		--
34	Center-tap	Receiver audio output	22
35	High		22
36	Low		22
37	High	External Squelch Control	22
38	Arm		22
39	Low		22

TABLE 2-2. CONNECTOR DATA (CONT)

PIN NO.	FUNCTION		WIRE SIZE (AWG)
	UPPER INSERT		
A1	Spare		--
1	DC Ground		16
2	DC Ground		16
3	+27.5 VDC Switched Input		16
4	+27.5 VDC Switched Input		16
5	+27.5 VDC Unswitched Input		16
6	+27.5 VDC Unswitched Input		16
7	Spare		--
8	Spare		--
9	Remote On/Off		22
10	Open	Muting Relay	22
11	Arm		22
12	Closed		22
13	Spare (Reserved for comm. disable)		--
14	Spare		--
15	High	Selcal and Data Link Audio	22
16	Low		22
17	Spare		--
18	Spare		--
19	Spare		--
20	Spare		--
21	High	Microphone Audio (0 dbm)	22
22	Low		22
23	Center-tap		22
24	Tuning In Process		22
25	Spare		--
26	High	ATCSS Audio Input	22
27	Low		22
28	Center-tap		22
29	Key		22
30	Microphone Audio		22
31	Microphone Push-To-Talk		22
32	Spare		--
33	Spare		--
34	Spare		--
35	Spare		--
36	Spare		--
37	Spare		--
38	Spare		--
39	Spare (Reserved for sharp selectivity)		--

2-15. INSTALLATION OF TRANSCEIVER IN EQUIPMENT RACK. Perform the following steps to install the transceiver in the equipment rack.

a. Slide transceiver into equipment rack until transceiver rear receptacle starts to engage with the rack connector.

b. Apply pressure on transceiver front panel until mating connectors are fully engaged.

c. Tighten hold-down clamps on the front of the equipment rack against hold-down hooks located on transceiver front panel.

2-16. FINAL TEST.

2-17. After the transceiver is installed in the aircraft, perform the following tests to insure that all aircraft interconnect wiring for the transceiver is properly installed.

a. Make sure that equipment rack is secured and that ground straps are securely attached to the airframe.

b. Inspect all interconnect wiring for broken wires, torn insulation, and loose connections.

c. Set control unit COMM OFF/PWR switch to the PWR position and energize the aircraft primary power circuit breaker.

d. Check for proper operation of the transceiver by operating the push-to-talk button on the microphone and contacting another aircraft or the airfield control tower.

SECTION III

OPERATION

3-1. GENERAL.

3-2. In the operating procedures described in this section, the transceiver is assumed to be:

a. Properly installed in an equipment rack or shock-mounted shelf in the aircraft.

b. Properly connected to the associated control unit and antenna in the aircraft, and to the aircraft wiring.

3-3. OPERATING PROCEDURE.

3-4. To ready the transceiver for operation, close the NAV/COMM aircraft circuit breaker. The three panel lights on the front panel of the associated control unit glow.

3-5. STARTING PROCEDURE. To start the transceiver set the communications OFF/PWR switch on the front panel of the control unit to the PWR position. Control unit VHF COMM frequency counter dials glow.

3-6. CHANNEL SELECTION. Rotate the control unit VHF COMM frequency selector knob to the desired megacycle position and rotate the fractional megacycle frequency selector knob to the desired fractional megacycle position. The transceiver automatically selects the desired frequency.

3-7. TRANSMIT. Operate the push-to-talk button on the aircraft microphone and speak into the microphone in a normal voice. Transmitted message is audible in the headset.

3-8. RECEIVE. The control unit VOL (volume) control is set during reception of communications signal. Adjust the control until voice signals heard in the headset are clearly audible.

3-9. COMMUNICATIONS TEST. The COMM TEST switch located on the control unit front panel provides a simple means of checking receiver operation. In the absence of a readable signal, depress the COMM TEST switch. This disables receiver squelch action, resulting in receiver background noise and frequently permits signals below the squelch threshold of the receiver to be heard.

3-10. STOPPING PROCEDURE. To stop the transceiver, place the OFF/PWR switch in the OFF position.

SECTION IV

THEORY OF OPERATION

4-1. GENERAL.

4-2. This discussion of how the Wilcox Series 807 VHF Transceiver operates is separated into four parts. General transceiver operation is described first, followed by the more detailed theory of the receiver, transmitter, and power supply and control circuits.

4-3. GENERAL TRANSCEIVER THEORY.

4-4. The Wilcox Series 807 VHF Transceiver is an airborne unit capable of voice communications in the frequency range of 116.000 to 149.975 megacycles. A total of 1,360 channels (spaced 25 kc apart) are available for use on either transmit or receive modes of operation. Major elements of the transceiver are shown in figure 4-1. For complete circuit details, refer to the over-all schematic diagram in figure 7-1. Basically, the transceiver consists of separate receiver and transmitter circuits plus such common circuitry as is required to perform frequency conversion, diode switching, bias tuning, power supply, and control functions. Transfer from the receive mode of operation to the transmit mode is accomplished by pressing the microphone push-to-talk (ptt) switch. Selection of either mode disables the circuits of the unused mode.

4-5. Except for the transmitter power amplifier, the transceiver is a completely transistorized unit. To insure stable operation, voltage regulation and temperature stabilization circuits are used extensively, in conjunction with feedback and automatic gain control (agc). A biased-diode crystal switching arrangement is used to accomplish channel selection in accordance with the digital binary 'two-out-of-five' (2 x 5) frequency control system described in ARINC Characteristic No. 410. A meter and meter switch are included to permit a check on the more important circuits. Use of an antenna transfer relay allows the same antenna to be used for both the transmit and receive modes. Control circuits automatically 'key' the transmitter when the Air Traffic Control Signalling System (ATCSS) is operational.

4-6. RECEIVER THEORY.

4-7. GENERAL.

4-8. The receiver is a superheterodyne utilizing an rf amplifier followed by a triple conversion system containing a total of six crystal-controlled oscillators, a frequency doubler, an injection amplifier, and five mixers. The conversion system provides a variable i-f of 15.1 to 16.075 mc, a fixed i-f of 3.5 mc, and a fixed i-f of 455 kc. The channel frequency on which the receiver is to operate is determined by the digital binary (2 x 5) information supplied to the transceiver from the Wilcox Type 97650-100 control unit. The digital information causes switching diodes in the transceiver to adjust the crystal oscillators to the operating frequency which is correct for the channel frequency determined by the control unit. The frequency selection process in the transceiver involves switching the ten's oscillator on or off, switching between the two unit oscillators, and switching crystals in each of the active unit's, tenth's, and hundredth's oscillators. A total of thirty-six crystals are used in the receiver. Varactor-tuned filters are employed in front-end and

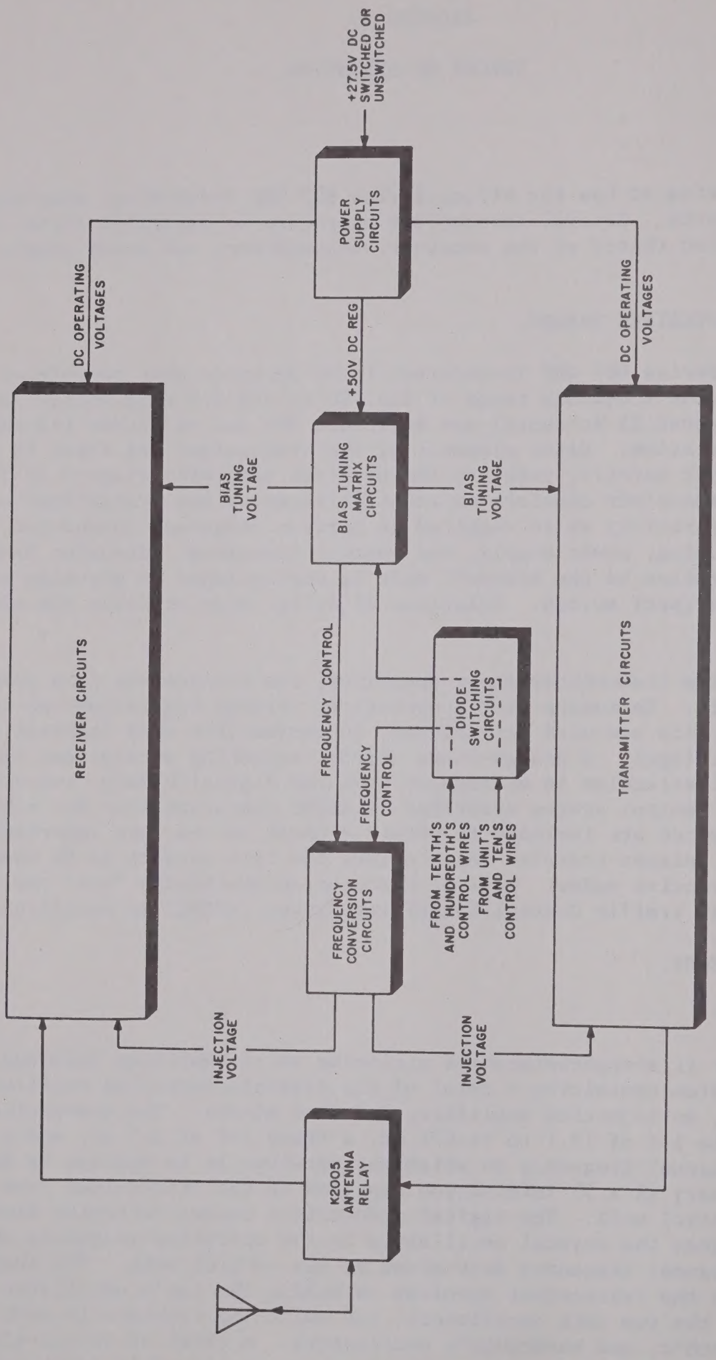

+27.5V DC
SWITCHED OR
UNSWITCHED
POWER SUPPLY CIRCUITS
DC OPERATING VOLTAGES
DC OPERATING VOLTAGES
+50V DC REG
RECEIVER CIRCUITS
BIAS TUNING VOLTAGE
BIAS TUNING MATRIX CIRCUITS
BIAS TUNING VOLTAGE
TRANSMITTER CIRCUITS
FREQUENCY CONTROL
DIODE SWITCHING CIRCUITS
FREQUENCY CONTROL
FROM TENTH'S AND HUNDREDTH'S CONTROL WIRES
FROM UNIT'S AND TEN'S CONTROL WIRES
FREQUENCY CONVERSION CIRCUITS
INJECTION VOLTAGE
INJECTION VOLTAGE
K2005 ANTENNA RELAY

Figure 4-1. VHF Transceiver Series 807, Simplified Block Diagram

injection stages. These filters are 'tracked' with the frequency selection circuits during the channel selection process by means of a predetermined level of bias voltage obtained from a bias tuning matrix. This arrangement provides a relatively constant front-end bandpass over the entire tuning range of the receiver. Following the conversion circuits are three i-f amplifiers, an audio detector, agc control circuit, squelch circuit and noise limiter, and a three-stage audio amplifier. A Selcal/ATCSS amplifier is included for use in a data link system. For complete receiver circuit details, refer to the schematic diagram in figure 7-1.

4-9. RECEIVER BLOCK DIAGRAM.

4-10. A block diagram of the receiver is shown in figure 4-2. During receive operation, the communications antenna is connected through contacts on antenna relay K2005 to the input of tracked filter FL101. Filter FL101 is 'tracked' or tuned for a centered bandpass on the selected receiving channel by means of a bias tuning voltage obtained from the bias tuning matrix. A received signal, in the frequency range of 116.000 to 149.975 megacycles, is passed through filter FL101 and applied to the input of rf amplifier Q101. The amplified output of Q101 is coupled through a second tracked filter, FL102, and applied to first mixer Q102.

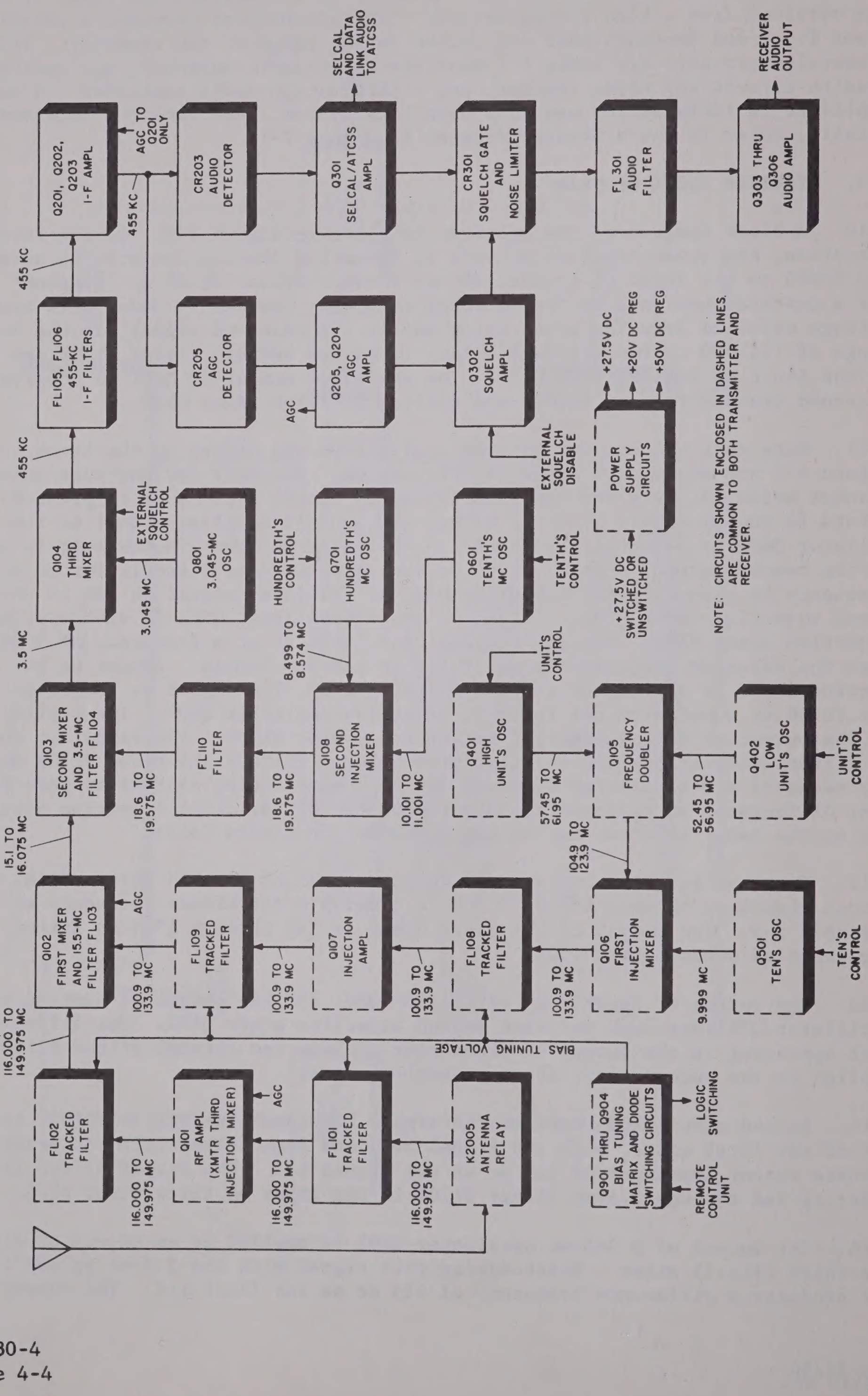
4-11. Note that the outputs of some oscillators and mixers on the block diagram in figure 4-2 are shown as a range of frequencies. However, for any particular receiver channel selected, only one specific frequency within each range is present at these points in the synthesis scheme. Either high unit's oscillator Q401 or low unit's oscillator Q402 is selected for operation when a given receiving channel is selected at the remote control unit. Output of the selected unit's oscillator is doubled in frequency by frequency doubler Q105, and the resultant signal is fed to the input of first injection mixer Q106. Output of ten's oscillator Q501 is also applied to first injection mixer Q106. The ten's oscillator operates on a frequency of 9.999 mc only when the selected receiver channel falls in certain ranges. Output of the first injection mixer is applied to tracked filter FL108. The signal at the output of filter FL108 is coupled to the input of injection amplifier Q107. The amplified signal at the output of Q107 is applied to tracked filter FL109. The signal at the output of filter FL109 is applied to first mixer Q102. Filters FL108 and FL109 are tracked (by means of a bias voltage obtained from the bias tuning matrix) to pass either the sum, difference, or fundamental output products of the first injection mixer, depending on the range in which the selected channel frequency falls.

4-12. First mixer Q102 combines the output signal of tracked filter FL102 with the output signal of tracked filter FL109 to develop a difference frequency as the first variable i-f. The output of the first mixer is fed through 15.5-mc filter FL103 to the input of second mixer Q103.

4-13. The output of tenth's mc oscillator Q601 and the output of hundredth's mc oscillator Q701 are both fed into second injection mixer Q108. The difference product appearing in the output of transistor Q108 is fed through filter FL110 and applied to the second mixer as an injection signal.

4-14. Second mixer Q103 combines the signal obtained from filter FL103, in the output of the first mixer, with the signal obtained from filter FL110 to develop a difference center frequency of 3.5 mc as the second i-f. The output of the second mixer is fed through 3.5-mc filter FL104 to the input of third mixer Q104.

4-15. The output of 3.045-mc oscillator Q801 is applied as an injection signal to the third (final) mixer. Heterodyning this signal with the 3.5-mc second i-f signal produces a difference frequency of 455 kc as the final i-f. The output of third


FL102 TRACKED FILTER
116.000 TO 149.975 MC
Q101 RF AMPL (XMTR THIRD INJECTION MIXER)
AGC
116.000 TO 149.975 MC
FL101 TRACKED FILTER
116.000 TO 149.975 MC
K2005 ANTENNA RELAY
BIAS TUNING VOLTAGE
Q901 THRU Q904 BIAS TUNING MATRIX AND DIODE SWITCHING CIRCUITS
REMOTE CONTROL UNIT
LOGIC SWITCHING
116.000 TO 149.975 MC
Q102 FIRST MIXER AND 15.5-MC FILTER FL103
AGC
100.9 TO 133.9 MC
FL109 TRACKED FILTER
100.9 TO 133.9 MC
Q107 INJECTION AMPL
100.9 TO 133.9 MC
FL108 TRACKED FILTER
100.9 TO 133.9 MC
Q106 FIRST INJECTION MIXER
9.999 MC
Q501 TEN'S OSC
TEN'S CONTROL
15.1 TO 16.075 MC
Q103 SECOND MIXER AND 3.5-MC FILTER FL104
18.6 TO 19.575 MC
FL110 FILTER
18.6 TO 19.575 MC
Q108 SECOND INJECTION MIXER
10.101 TO 11.001 MC
Q401 HIGH UNIT'S OSC
UNIT'S CONTROL
57.45 TO 61.95 MC
Q105 FREQUENCY DOUBLER
104.9 TO 123.9 MC
52.45 TO 56.95 MC
Q402 LOW UNIT'S OSC
UNIT'S CONTROL
3.5 MC
Q104 THIRD MIXER
3.045 MC
Q801 3.045-MC OSC
EXTERNAL SQUELCH CONTROL
HUNDREDTH'S CONTROL
Q701 HUNDREDTH'S MC OSC
8.499 TO 8.574 MC
Q601 TENTH'S MC OSC
TENTH'S CONTROL
+27.5V DC SWITCHED OR UNSWITCHED
POWER SUPPLY CIRCUITS
+27.5V DC
+20V DC REG
+50V DC REG
455 KC
FL105, FL106 455-KC I-F FILTERS
CR205 AGC DETECTOR
AGC
Q205, Q204 AGC AMPL
Q302 SQUELCH AMPL
EXTERNAL SQUELCH DISABLE
455 KC
Q201, Q202, Q203 I-F AMPL
455 KC
AGC TO Q201 ONLY
CR203 AUDIO DETECTOR
Q301 SELCAL/ATCSS AMPL
SELCAL AND DATA LINK AUDIO TO ATCSS
CR301 SQUELCH GATE AND NOISE LIMITER
FL301 AUDIO FILTER
Q303 THRU Q306 AUDIO AMPL
RECEIVER AUDIO OUTPUT

NOTE: CIRCUITS SHOWN ENCLOSED IN DASHED LINES ARE COMMON TO BOTH TRANSMITTER AND RECEIVER.

Figure 4-2. Receiver Block Diagram

mixer Q104 is coupled through 455-kc i-f filters FL105 and FL106 to reject unwanted frequencies and noise and is then applied to the input of the i-f amplifier. A connection is completed to the input of the third mixer to permit use of an external squelch level control.

4-16. A three-stage i-f amplifier is employed utilizing transistors Q201, Q202, and Q203. The 455-kc signal appearing at the output of this amplifier is applied to audio detector CR203. The detector recovers the audio information from the 455-kc i-f signal, and the audio signal is coupled directly to the input of Selcal/ATCSS amplifier Q301. Transistor Q301 amplifies data link audio signals and applies them to the ATCSS. Receiver audio signals are fed from transistor Q301 to squelch gate and noise limiter diode CR301.

4-17. A portion of the 455-kc i-f signal present at the input of audio detector CR203 is coupled to agc detector diode CR205. The dc portion of the rectified output of the agc detector is amplified by the agc amplifier formed by transistors Q205 and Q204 and applied as a gain control voltage to the rf amplifier, first mixer, and to transistor Q201 in the first stage of the i-f amplifier. The collector current of transistor Q205 is used to control squelch amplifier Q302.

4-18. Squelch amplifier Q302 reverse-biases squelch gate diode CR301 until a readable signal is obtained. When a signal of sufficient amplitude is received, the higher collector current of transistor Q205 causes the squelch amplifier to switch off. This removes reverse bias from the squelch gate and permits the audio signals to be applied through audio filter FL301 to the input of the audio amplifier. The squelch gate diode also functions as a noise limiter. A connection is completed to the input of the squelch amplifier to permit use of an external squelch disable switch.

4-19. The three-stage audio amplifier formed by transistors Q303 through Q306 amplifies the receiver audio signals to the required level. Output of this amplifier is applied to the aircraft audio system.

4-20. Dc operating voltages for the receiver are furnished by the transceiver power supply.

4-21. BANDPASS FILTER AND RF AMPLIFIER CIRCUITRY.

4-22. Rf signals from the antenna enter the receiver via pin A1 of the lower insert on rear connector J1. From pin A1, the rf signals are fed through a short length of coaxial cable terminated in plug P2002 to connector J2002 on antenna relay K2005. From this point, the rf signals are routed through the relay contacts and mating connectors J2003/P2003, and applied across the 50-ohm input impedance of tuned filter FL101. Filter FL101 is a hermetically sealed unit that encloses variable-tuned input and output sections in addition to a bias isolation network. The voltage-variable capacitor-diode (varactor) used in each tuned section serves as the variable tuning element. The capacitor-diodes are silicon PN junction devices that vary in capacitance with the level of reverse bias voltage applied to the capacitor-diodes from the bias tuning matrix. Operation of the matrix circuit is coordinated with the channel selection process in such a manner that for any frequency between 116.000 and 149.975 mc, the predetermined level of bias voltage applied to the capacitor-diodes from the matrix will cause the capacitor-diodes to tune filter FL101 to the center frequency of the correct passband. A total of 34 'step-tuned' passbands are used to cover the receiver tuning range. The passband center frequencies are spaced approximately one megacycle apart. Variations in filter sensitivity across each passband are determined to a large extent by the peak-to-valley ratio of the filter.

This ratio is held to less than 2 db. Filter skirt width is purposely narrow to provide good image attenuation at frequencies outside each passband and to aid in the suppression of cross-modulation. Output impedance of filter FL101 is matched to the input impedance of the rf amplifier.

4-23. Transistor Q101 is employed in a common-emitter configuration as a low-noise rf amplifier. Switching diode CR101 is reverse biased in the receive mode to prevent the rf input signal from being shorted to ground. Proper bias is supplied from the +20-volt regulated dc supply. Capacitor C104 serves as an emitter bypass for the signal frequency range. Agc control voltage is supplied to the base of Q101 through a filter and decoupling network. Resistor R104 provides additional forward agc control and is by-passed for the signal frequency range by capacitor C103. Output from transistor Q101 is fed through tuned filter FL102 and coupled by capacitor C102 to the base of first mixer Q102. Filter FL102 is similar in construction to filter FL101, and is also 'tracked' with the frequency selection circuits.

4-24. FREQUENCY CONVERSION CIRCUITRY.

4-25. GENERAL. The receiver employs the triple conversion principle. Channel selection is accomplished through a frequency synthesis system which is controlled by diodes operated as solid-state switches. Reference to the receiver block diagram in figure 4-2 will aid in understanding the interrelationship between the various oscillators and mixers used in the synthesis scheme.

4-26. The rf signal frequency in the range of 116.000 to 149.975 mc is supplied to the first mixer. The first mixer is also supplied with an injection signal in the frequency range of 100.9 to 133.9 mc. The mixing action of the first mixer produces a center frequency difference output of 15.5 mc which is fed through a filter and applied to the input of the second mixer. The second mixer is also supplied with an injection signal in the frequency range of 18.6 to 19.575 mc. The mixing action of the second mixer produces a difference output of 3.5 mc which is fed through a filter and applied to the input of the third (final) mixer. The third mixer also receives the output of the 3.045-megacycle oscillator. The two signals are combined in the third mixer to produce a difference frequency of 455 kc. This frequency is fed through two filters and applied to the input of the i-f amplifier.

4-27. The derivation of the various injection frequencies has been generally discussed in the block diagram analysis given in preceding paragraphs 4-9 through 4-20. Table 4-1 gives a detailed listing of the state of each receiver oscillator (active or inactive) and the frequency of each oscillator during the selection of any channel frequency digit over the tuning range of the receiver. Table 4-1 can thus be used as a reference in deriving the frequencies present at any point in the synthesis scheme.

4-28. TEN'S OSCILLATOR. Transistor Q501 is employed as the ten's oscillator. A Pierce grounded-collector circuit configuration is used. Although two crystals are employed in the oscillator circuit, only crystal Y502 is used for receiver operation. The oscillator operates on a frequency of 9.999 mc only when receiver channels 116.000 through 119.975 mc or 140.000 through 149.975 mc have been selected at the remote control unit (see Table 4-1). The oscillator is inoperative over the receiver frequency range of 120.000 to 139.975 mc. The ten's oscillator is turned off when the C10 control wire is grounded through the action of the channel selection circuits. Crystal Y502 is operated at parallel resonance on its fundamental frequency. Feedback occurs in the transistor oscillator from emitter to base, through the tank circuit formed by the inductance of the selected crystal and the circuit capacities. The circuit capacities are chosen so as to establish proper crystal

TABLE 4-1. RECEIVER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Crystal
11X.XXX	Ten's	9.999	Y502
12X.XXX	"	Not Active	--
13X.XXX	"	" "	--
14X.XXX	"	9.999	Y502
110.XXX	Low Unit's	52.450	Y418
120.XXX	" "	"	"
111.XXX	" "	52.950	Y411
121.XXX	" "	"	"
112.XXX	" "	53.450	Y416
122.XXX	" "	"	"
113.XXX	" "	53.950	Y412
123.XXX	" "	"	"
114.XXX	" "	54.450	Y419
124.XXX	" "	"	"
115.XXX	" "	54.950	Y413
125.XXX	" "	"	"
116.XXX	" "	55.450	Y417
126.XXX	" "	"	"
117.XXX	" "	55.950	Y414
127.XXX	" "	"	"
118.XXX	" "	56.450	Y420
128.XXX	" "	"	"
119.XXX	" "	56.950	Y415
129.XXX	" "	"	"
130.XXX	High Unit's	57.450	Y408
140.XXX	" "	"	"
131.XXX	" "	57.950	Y401
141.XXX	" "	"	"
132.XXX	" "	58.450	Y406
142.XXX	" "	"	"
133.XXX	" "	58.950	Y402
143.XXX	" "	"	"
134.XXX	" "	59.450	Y409
144.XXX	" "	"	"
135.XXX	" "	59.950	Y403
145.XXX	" "	"	"
136.XXX	" "	60.450	Y407
146.XXX	" "	"	"
137.XXX	" "	60.950	Y404
147.XXX	" "	"	"
138.XXX	" "	61.450	Y410
148.XXX	" "	"	"
139.XXX	" "	61.950	Y405
149.XXX	" "	"	"

TABLE 4-1 (CONT). RECEIVER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Cystal
1XX.0XX	Tenth's Mc	10.101	Y608
1XX.1XX	" "	10.201	Y601
1XX.2XX	" "	10.301	Y606
1XX.3XX	" "	10.401	Y602
1XX.4XX	" "	10.501	Y609
1XX.5XX	" "	10.601	Y603
1XX.6XX	" "	10.701	Y607
1XX.7XX	" "	10.801	Y604
1XX.8XX	" "	10.901	Y610
1XX.9XX	" "	11.001	Y605
1XX.X00	Hundredth's Mc	8.499	Y702
1XX.X25	" "	8.524	Y701
1XX.X50	" "	8.549	Y703
1XX.X75	" "	8.574	Y704
Example Frequencies:			
116.000	Ten's	9.999 ①	
	Low Unit's	55.450	
	High Unit's	Not Active	
	Tenth's Mc	10.101	
	Hundredth's Mc	8.499	
119.975	Ten's	9.999 ①	
	Low Unit's	56.950	
	High Unit's	Not Active	
	Tenth's Mc	11.001	
	Hundredth's Mc	8.574	
120.000	Ten's	Not Active	
	Low Unit's	52.450	
	High Unit's	Not Active	
	Tenth's Mc	10.101	
	Hundredth's Mc	8.499	
129.975	Ten's	Not Active	
	Low Unit's	56.950	
	High Unit's	Not Active	
	Tenth's Mc	11.001	
	Hundredth's Mc	8.574	

TABLE 4-1 (CONT). RECEIVER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Crystal
Example Frequencies (Cont):			
130.000	Ten's	Not Active	
	Low Unit's	Not Active	
	High Unit's	57.450	
	Tenth's Mc	10.101	
	Hundredth's Mc	8.499	
139.975	Ten's	Not Active	
	Low Unit's	Not Active	
	High Unit's	61.950	
	Tenth's Mc	11.001	
	Hundredth's Mc	8.574	
140.000	Ten's	9.999 ②	
	Low Unit's	Not Active	
	High Unit's	57.450	
	Tenth's Mc	10.101	
	Hundredth's Mc	8.499	
149.975	Ten's	9.999 ②	
	Low Unit's	Not Active	
	High Unit's	61.950	
	Tenth's Mc	11.001	
	Hundredth's Mc	8.574	

① Ten's oscillator frequency subtracted from output of frequency doubler to arrive at first mixer injection frequency.

② Ten's oscillator frequency added to output of frequency doubler to arrive at first mixer injection frequency.

loading conditions while providing the correct transistor impedance match. Resistors R505, R507, and R509 establish the proper starting bias conditions for the oscillator. Oscillator output is taken from the emitter of Q501 and coupled through capacitor C506 and coil L120 to the emitter of first injection mixer Q106. Capacitors C505 and C125 and coil L120 comprise a low-pass filter used to attenuate higher-order harmonics of the oscillator.

4-29. **LOW UNIT'S OSCILLATOR.** Transistor Q402 is employed as the low unit's oscillator. A Colpitts common-emitter circuit configuration is used with the selected crystal in the feedback path from base to collector (ground). Ten Type CR67/U low temperature coefficient crystals, Y411 through Y420, are switched in a "two-out-of-five" (2 x 5) biased-diode switching circuit, designed in accordance with ARINC Characteristic No. 410. Each crystal is mounted in a Type HC-18/U holder which plugs into the oscillator circuitry. The operating frequencies of the ten crystals are spaced 500 kc apart in the range of 52.45 to 56.95 mc. The selected crystal is operated at series resonance on the fifth overtone mode of the fundamental frequency of the crystal. The oscillator operates only when channel frequencies 116.000 through 129.975 mc have been selected at the remote control unit (see Table 4-1). The oscillator is inoperative over the channel frequency range of 130.000 to 149.975 mc. The low unit's oscillator is turned off when the B10 and C10 control wires are grounded, or when the B10 and D10 control wires are grounded, through the action of the channel selection circuits. Control wires B10, C10, and D10 are combined in the diode switching circuitry to form a single control wire which is routed to the low unit's oscillator. This control wire provides a switching function exactly opposite to that provided by the A10 control wire discussed with the high unit's oscillator. A tuned pi-network tank circuit is employed in the collector of transistor Q402 to provide the necessary 180-degree phase reversal (in respect to the base) required for sustained oscillations. Variable inductor L402 tunes the tank for optimum oscillator performance. Capacitor C408 and resistor R408 serve as a means of matching the output load to the oscillator. Oscillator output is coupled from the tank circuit by capacitor C406 and is applied to the base of frequency doubler transistor Q105 through isolation resistor R435.

4-30. **HIGH UNIT'S OSCILLATOR.** Transistor Q401 is employed as the high unit's oscillator. The oscillator circuit is identical to that employed for the low unit's oscillator. Ten crystals, Y401 through Y410, are switched in the oscillator. The operating frequencies of the crystals are spaced 500 kc apart in the range of 57.45 to 61.95 mc. The selected crystal is operated on the fifth overtone mode of the fundamental frequency of the crystal. The oscillator operates only when channel frequencies 130.000 through 149.975 mc have been selected at the remote control unit (see Table 4-1). The oscillator is inoperative over the channel frequency range of 116.000 to 129.975 mc. The high unit's oscillator is turned off when the A10 control wire is grounded through the action of the channel selection circuits. Variable inductor L401 tunes the oscillator tank circuit for optimum oscillator performance. Oscillator output is coupled from the tank circuit by capacitor C401 and is applied to the base of frequency doubler transistor Q105 through isolation resistor R434.

4-31. **FREQUENCY DOUBLER.** Transistor Q105 serves as the frequency doubler. The output signal of the active unit's oscillator is applied to the base of transistor Q105. Resistors R434 and R435 provide isolation between the two unit oscillator circuits. Signals appearing in the output of Q105 are applied to filter FL107. Filter FL107 is a hermetically sealed unit designed to pass a range of frequencies from 104.9 to 123.9 mc. The second order harmonic of the 52.45 to 61.95 mc input signal, appearing at the collector of transistor Q105, is passed through filter FL107 and applied to the base of first injection mixer Q106.

4-32. FIRST INJECTION MIXER. Transistor Q106 is employed as the first injection mixer. The frequency doubler output signal obtained from filter FL107 is direct-coupled to the base of transistor Q106. Resistors R130 and R129 constitute a voltage divider to supply the proper base bias to transistor Q106. The ten's oscillator output signal is applied to the emitter of transistor Q106.

4-33. Since the injection frequencies applied to the first injection mixer vary over a wide range, a 'tracked' filter (FL108) is employed in the output of the mixer to maintain proper tuning. Filter FL108 is similar in construction to tuned filters FL101 and FL102 used in the rf amplifier circuitry. Filter FL108 is 'tracked' (tuned) during the channel selection process by means of a predetermined level of bias voltage obtained from the bias tuning matrix.

4-34. Injection signals from the output of frequency doubler Q105 and ten's oscillator Q501 are combined in the first injection mixer over the channel frequency range of 116.000 to 119.975 mc. Over this range of channel frequencies, filter FL108 is tracked to pass the difference frequency of the two injection signals.

4-35. Only the output of frequency doubler Q105 is applied to the first injection mixer over the channel frequency range of 120.000 to 129.975 mc. Over this range of channel frequencies, filter FL108 is tracked to pass only the doubled output of the low unit's oscillator.

4-36. Only the output of frequency doubler Q105 is applied to the first injection mixer over the channel frequency range of 130.000 to 139.975 mc. Over this range of channel frequencies, filter FL108 is tracked to pass only the doubled output of the high unit's oscillator.

4-37. Injection signals from the output of frequency doubler Q105 and ten's oscillator Q501 are combined in the first injection mixer over the channel frequency range of 140.000 to 149.975 mc. Over this range of channel frequencies, filter FL108 is tracked to pass the sum frequency of the two injection signals.

4-38. INJECTION AMPLIFIER. Transistor Q107 serves as the injection amplifier. The first injection mixer output signal from 'tracked' filter FL108 is coupled through capacitor C124 to the base of transistor Q107. Resistors R124 and R122 establish the proper base bias for Q107. Output of the injection amplifier, in the range of 100.900 to 133.900 mc, is fed through 'tracked' filter FL109 and coupled to the emitter of first mixer Q102 through capacitor C144 and switching diode CR102. Switching diode CR103 is reverse biased in the receive mode, thereby isolating the first mixer injection signal from the transmitter circuits. Filter FL109 is similar in construction and operation to filter FL108 in the output of first injection mixer Q106.

4-39. FIRST MIXER. The 116.000 to 149.975 mc signal obtained from the output of tracked filter FL102 and an injection signal in the range of 100.9 to 133.9 mc obtained from the output of tracked injection filter FL109 are coupled to the base and emitter, respectively, of transistor Q102. The first mixer combines the two signals to produce the first variable i-f frequency in the range of 15.1 to 16.075 mc. The exact i-f frequency produced is determined by the ten/unit channel frequency that has been selected. Coil L124 and capacitor C110 form a tuned circuit resonant at the first i-f frequency. This tuned circuit prevents degeneration in the first mixer, thereby improving mixer gain.

4-40. Resistors R107 and R108 constitute a voltage divider used to supply the proper base bias to transistor Q102, through the agc circuitry, from the +20-volt regulated dc supply. Resistor R109 in the collector circuit is included to provide additional forward agc control, and is by-passed by capacitor C108 for the first intermediate frequency. The first i-f signal present on the collector of Q102 is coupled by capacitor C108 directly to the input of bandpass filter FL103.

4-41. Coupling between the first and second mixers is accomplished by filter FL103. Filter FL103 is a fixed-tuned band-pass device contained in a hermetically sealed case. The filter has a center frequency of about 15.5 mc with approximately a one-megacycle passband which extends from 15.1 to 16.075 mc. This range is sufficient to pass the forty fractional-ending channels that are contained within each whole (unit) megacycle channel over the receiver tuning range. Maximum attenuation over the filter passband is less than 2 db. The first i-f signal is coupled through the filter and applied directly to the base of the second mixer.

4-42. TENTH'S MC OSCILLATOR. Transistor Q601 is employed as the tenth's mc oscillator. Circuit operation is similar to the low (or high) unit's oscillator. No tuned circuit is used. Ten Type CR69/U crystals (Y601 through Y610) are switched in a '2 x 5' biased-diode switching circuit, designed in accordance with ARINC Characteristic No. 410. Each crystal is mounted in a Type HC-18/U holder which plugs into the oscillator circuitry. Operating frequencies of the ten crystals are spaced 100 kc apart in the range of 10.101 to 11.001 mc. The selected crystal is operated at parallel resonance on its fundamental frequency. The oscillator operates from the +20-volt regulated dc source in the equipment. Application of the +20-volt regulated dc supply is controlled by power control relay K2002. Oscillator output is coupled from the emitter of transistor Q601 by capacitor C601, and is fed through isolation and filter networks to the base of second injection mixer Q108.

4-43. HUNDREDTH'S MC OSCILLATOR. Transistor Q701 serves as the hundredth's mc oscillator. Circuit operation is identical to that of the tenth's mc oscillator except for the number of crystals switched and the different frequency range covered. Four Type CR69/U crystals (Y701 through Y704) are switched in the hundredth's oscillator circuit. Operating frequencies of the four crystals are spaced 25 kc apart in the range of 8.499 to 8.574 mc. The selected crystal is operated at parallel resonance on its fundamental frequency. The oscillator operates from the +20-volt regulated dc supply. Application of the +20-volt potential is controlled by power control relay K2002. Oscillator output is coupled from the emitter of transistor Q701 by capacitor C701, and is fed through isolation and filter networks to the base of second injection mixer transistor Q108.

4-44. SECOND INJECTION MIXER. Transistor Q108 functions as the second injection mixer. The output of tenth's mc oscillator Q601, in the range of 10.101 to 11.001 mc, and the output of hundredth's mc oscillator Q701, in the range of 8.499 to 8.574 mc, are both applied to the base of transistor Q108. Resistors R135 and R136 provide isolation between the two oscillators. A low-pass filter consisting of capacitors C129 and C130 and coil L113 rejects second- and higher-order harmonics of the tenth's and hundredth's megacycle oscillators. The sum and difference products appearing in the collector circuit of transistor Q108 are coupled to the input of filter FL110, which separates the sum component to develop a filtered injection signal for the second mixer.

4-45. Resistors R134 and R132 constitute a voltage divider to supply the proper base bias to transistor Q108 from the +20-volt regulated dc supply. The signals present on the collector of transistor Q108 are fed directly to the input of injection filter FL110. Filter FL110 is a fixed-tuned band-pass device contained in a hermetically sealed case. The filter has a center frequency of about 19 mc with approximately a one-megacycle bandpass which extends from 18.6 to 19.575 mc. The output of the filter is applied to the base of the second mixer through isolation resistor R112.

4-46. SECOND MIXER. Transistor Q103 is employed as the second mixer. The second mixer combines the signal obtained from the output of filter FL103 (in the range of 15.1 to 16.075 mc) with the signal obtained from the output of injection filter FL110 (in the range of 18.6 to 19.575 mc) to develop a difference center frequency of 3.5 mc as the second (fixed) i-f.

4-47. Resistors R113 and R114 constitute a voltage divider used to supply the proper base bias to transistor Q103 from the +20-volt regulated dc supply. Capacitor C141 and coil L122 form a tuned circuit resonant at 3.5 mc. This tuned circuit prevents degeneration,thereby improving mixer gain. The second i-f signal present on the collector of transistor Q103 is applied directly to the input of filter FL104. Resistor R115 matches the input of the filter to the transistor collector.

4-48. Coupling between the second and third mixers is accomplished by filter FL104. Filter FL104 is a fixed-tuned device contained in a hermetically sealed case. The filter has a center frequency of 3.5 mc with a bandwidth of approximately 100 kc. The 3.5-mc signal at the output of the filter is applied directly to the base of the third mixer.

4-49. 3.045-MC OSCILLATOR. Transistor Q801 serves as the 3.045-mc oscillator. A single crystal (Y801) is used in a Colpitts common-emitter circuit configuration with the crystal connected in the feedback path from base to collector (ground). Crystal Y801, a Type CR/66U, is operated at parallel resonance on its fundamental frequency. The oscillator operates from the +20-volt regulated dc source in the equipment. Application of the +20-volt regulated dc supply is controlled by power control relay K2002. Oscillator output is fed from the emitter of transistor Q801 through a filter network and capacitor C117 to the base of the third mixer.

4-50. THIRD MIXER. Transistor Q104 serves as the third (final) mixer. The third mixer combines the 3.5 mc second i-f signal obtained from the output of filter FL104 with an injection signal obtained from 3.045-mc oscillator Q801 to develop a difference frequency of 455 kc as the third (final) i-f. A low-pass filter consisting of capacitors C801 and C118 and coil L110 rejects second- and higher-order harmonics of the 3.045-mc oscillator. Resistor R119 matches the low-pass filter to the base of Q104. Capacitor C117 and coil L107 form a tuned circuit resonant at 455 kc. The tuned circuit provides a low base-to-emitter impedance for the final i-f signal, thereby improving mixer gain.

4-51. Resistors R118 and R117 constitute a voltage divider used to supply the proper base bias to transistor Q104 from the +20-volt regulated dc supply. The 455-kc signal at the collector of Q104 is fed through filters FL105 and FL106 to the input of the three-stage i-f amplifier. Filters FL105 and FL106 reject unwanted frequencies and noise. Filter FL106 is a piezo-electric ladder-type ceramic unit that can be supplied with either 'normal' or 'sharp' selectivity characteristics. Response of the 'normal' filter is such that attenuation is no more than 6 db at ±15 kc from the 455-kc center frequency and 60 db or greater at ±31.5 kc. Response of the 'sharp' filter (required for 25-kc adjacent-channel operation) is such that attenuation is no more than 6 db at ±6 kc from the center frequency and 60 db or greater at ±18.5 kc. A circuit is provided at the input of third mixer Q104 to permit the optional connection of a remote squelch control. Coil L106, connected to the base of the third mixer, is returned to pin 38 of the lower insert on connector J1. Resistors R211 and R214 are returned to pins 39 and 37, respectively, of the lower insert on connector J1 to complete the circuit. Proper connection of a remote squelch control to pins 37, 38, and 39 provides a means of adjusting the gain of the third mixer as a method of achieving external squelch control.

4-52. CHANNEL SELECTION CIRCUITS.

4-53. GENERAL. An oscillator/crystal switching arrangement is used to accomplish channel selection in the Series 807 VHF Transceiver, utilizing diodes as switching and isolating elements. Selection of the ten's-megacycle channel is accomplished in a "two-out-of-five" (2 x 5) selection system. The unit's, tenth's, and hundredth's oscillators are each arranged in a '2 x 5' selection circuit. Because of the close relationship and common circuitry with the channel selection system, the bias tuning matrix is included as a part of the channel selection discussion.

4-54. TEN MC SELECTION CIRCUITRY. Ten-megacycle channel selection is accomplished in a '2 x 5' circuit arrangement which employs a total of three oscillators; the ten's oscillator, the low unit's oscillator, and the high unit's oscillator. The ten's channel is chosen by switching the ten's oscillator on or off, and switching between the two unit's oscillators. The ten's oscillator is used to select a band of frequencies in a range determined by the selection of the unit's oscillator (low, or high). Control of the ten's oscillator is accomplished in a switching circuit utilizing isolation diode CR503. The anode of diode CR503 is returned through a biasing network to the emitter of the ten's oscillator. The cathode of the isolation diode is returned via the C10 control wire to switching circuits in the remote control unit. Whenever the cathode of diode CR503 is grounded through action of the switching circuits in the remote control unit, diode CR503 conducts applying reverse bias to the ten's oscillator transistor through resistor R510. The ten's oscillator is thus disabled, resulting in the selection of one of two bands of frequencies, either 120.000 to 129.975 mc, or 130.000 to 139.975 mc. The specific band selected is determined by the unit's oscillator that is in operation (low, or high). When control wire C10 is disconnected from ground by the action of the switching circuits in the remote control unit, diode CR503 ceases to conduct causing the ten's oscillator to turn on. Placing the ten's oscillator in operation results in the selection of one of two different bands of frequencies, either 116.000 to 119.975 mc, or 140.000 to 149.975 mc. Again, the specific band that is selected is determined by the unit's oscillator that is in operation (low, or high).

4-55. Control of the two unit's oscillators is accomplished in the ten's matrix circuit utilizing switching diodes CR901 through CR907. The anode of each of these diodes is returned through a biasing resistor to a regulated source of +20-volts dc in the equipment. The cathodes of diodes CR901, CR906, and CR907 are returned to switching circuits in the remote control unit. When the cathodes of two of these four diodes are grounded through action of switching circuits in the remote control unit, the two respective diodes conduct to disable one or the other of the two unit's oscillators in the receiver.

4-56. The cathodes of switching diodes CR903 and CR907 are returned via the B10 and C10 control wires, respectively, to switching circuits in the remote control unit. The anodes of these two diodes are connected to the anodes of diodes CR904 and CR905, respectively, and to a voltage source obtained from the ten's matrix circuit. The cathodes of diodes CR904 and CR905 are connected to a common wire returned to the emitter circuit of the low unit's oscillator. When the cathodes of diodes CR903 and CR907 are grounded through action of the switching circuits in the remote control unit, diodes CR903 and CR907 conduct, and diodes CR904 and CR905 are reverse-biased. This reduces the emitter voltage supplied to the low unit's oscillator from the ten's matrix circuit, as well as the anode voltage supplied to rf crystal switching diodes CR411 through CR420. The reduced voltage disables the low unit's oscillator, resulting in the selection of a range of frequencies from 130.000 to 149.975 mc.

4-57. The cathodes of switching diodes CR903 and CR906 are returned via the B10 and D10 control wires respectively, to switching circuits in the remote control unit. The anodes of these two diodes are connected to the anodes of diodes CR904 and CR905 respectively, and to a voltage source obtained from the ten's matrix circuit. When the cathodes of diodes CR903 and CR906 are grounded through action of the switching circuits in the remote control unit, diodes CR903 and CR906 conduct, and diodes CR904 and CR905 are reverse-biased. This disables the low unit's oscillator in the manner previously described, again resulting in the selection of the range of frequencies from 130.000 to 149.975 mc.

4-58. The cathode of switching diode CR901 is returned via the A10 control wire to switching circuits in the remote control unit. The anode of diode CR901 is connected to a voltage source obtained from the ten's matrix circuit, and is also returned to the emitter circuit of the high unit's oscillator. When the cathode of diode CR901 is grounded by the action of the remote control unit, diode CR901 conducts thereby reducing the emitter voltage supplied to the high unit's oscillator as well as the anode voltage supplied to rf crystal switching diodes CR401 through CR410. This disables the high unit's oscillator, resulting in the selection of a range of frequencies from 116.000 to 129.975 mc.

4-59. UNIT MC SELECTION CIRCUITRY. Unit megacycle channel selection is accomplished in a '2 x 5' circuit arrangement which employs a total of twenty-five diodes. Diodes CR944, CR946, CR948, CR950, and CR952 serve as dc isolation diodes, while diode CR401 through CR420 provide rf switching. The anode of each of the twenty-five diodes is returned through a biasing network to a regulated source of +20-volts dc in the equipment. The cathode of each dc isolation diode is returned via one of the five unit megacycle control wires to switching circuits in the remote control unit. The anodes of rf switching diodes CR401 through CR410 are connected to a common bus which is coupled to the base of the high unit's oscillator through capacitor C405. The anodes of rf switching diodes CR411 through CR420 are connected to a separate bus which is coupled to the base of the low unit's oscillator through capacitor C410. The '2 x 5' selection system requires simultaneous grounding of two of the five unit megacycle control wires to accomplish selection of the desired crystal. Grounding a pair of control wires causes dc current to flow through the corresponding pair of isolation diodes and an rf decoupling network to turn on the rf switching diode associated with the desired crystal. This action connects the crystal to the base of the respective oscillator transistor through a capacitor (C405 or C410).

4-60. In order to make the operation of the '2 x 5' switching system more clearly visualized, the circuit actions necessary to select one crystal (in this case Y401) are discussed, the selection of any other one crystal proceeding in a similar manner. With the remote control unit set to a position such that unit megacycle wires 'A' and 'B' are grounded, dc current flows through isolation diodes CR952 and CR950, resistors R413 and R414, decoupling choke L403 (with the high unit's oscillator turned on), rf switching diode CR401, and resistor R406 to the controlled bias supply. When diode CR401 is switched to a conductive state its rf resistance becomes very low, thereby connecting crystal Y401 in the oscillator circuit through capacitor C405.

4-61. TENTH-MEGACYCLE SELECTION CIRCUITRY. The tenth-megacycle selection circuitry is practically identical to the unit megacycle selection circuitry. Diodes CR945, CR947, CR949, CR951, and CR953 serve as the dc isolation diodes. Diodes CR601 through CR610 provide .1-mc rf switching for the receiver. Five .1-megacycle control wires are used.

4-62. HUNDREDTH-MEGACYCLE SELECTION CIRCUITRY. The .01-megacycle selection circuitry is practically identical to the unit and tenth-megacycle selection circuitry. Diodes CR939 through CR943 serve as the dc isolation diodes. Diodes CR701 through CR704 provide .01-mc rf switching for the receiver. Five .01-megacycle control wires are used.

4-63. BIAS TUNING MATRIX AND DIODE SWITCHING CIRCUIT. The bias tuning matrix and diode switching circuit provides a means of selecting the proper unit's oscillator as well as the proper crystal frequency for the unit's, tenth's, and hundredth's oscillators. In addition, a means is provided for selecting the correct bias voltage for application to the varactor-tuned tracked filters used in the transceiver. This bias voltage establishes the correct resonant frequency for each tracked filter, thereby keeping the filter bandpass tuned or centered over the entire tuning range of the receiver. A different bias voltage, within the range of approximately 4 to 33 volts, is produced by the matrix circuits for each different unit-megacycle channel selected. Required bias voltages are produced by the systematic application or removal of a ground on the unit's and ten's control wires in accordance with the standard '2 x 5' channel selection system.

4-64. Diodes CR939 through CR953 serve as dc isolation diodes in the channel selection circuitry as well as in the unit's matrix circuit. The unit's matrix circuit employs nine matrix networks. Each network utilizes three switching diodes and a matrix resistor. Each network is supplied bias voltage through resistor R920 from the +20-volt regulated dc source in the equipment. When a given network is selected through the action of the switching circuits in the remote control unit, that network acts as one leg of a voltage divider connected across the input (base) circuit of the unit's amplifier, Q904. The nine networks are identical except for the values of the matrix resistors.

4-65. Operation of the matrix networks corresponding to unit digits 1 through 9 is identical. Following paragraph 4-66 describes the operation of the network utilized during the selection of unit digit 1. Paragraph 4-67 describes the operation of the network utilized during the selection of unit digit 0.

4-66. When unit digit "1" is selected at the remote control unit, a ground is applied to unit megacycle control wires 'A' and 'B'. This causes a dc current to flow through isolation diodes CR952 and CR950, and resistors R945 and R943, from the +20-volt regulated dc source in the transceiver. This action causes switching diodes CR937 and CR936 to become reverse-biased, forward-biasing switching diode CR935. A dc current path is then completed from the +20-volt regulated dc source through resistor R920, diode CR935, and resistor R929, to ground. A second dc current path is completed from the +20-volt regulated dc source through resistors R920, R909, and R910 and diode CR909, to ground. The base of unit's amplifier Q904 is connected to the junction of resistors R909 and R910. Thus, the base voltage applied to transistor Q904 is determined by the voltage divider consisting of resistor R929 and diode CR935 shunted by diode CR909, resistor R910, and resistor R909.

4-67. When unit digit "0" is selected at the remote control unit, a ground is applied to unit megacycle control wires 'B' and 'E'. This causes a dc current to flow from the +20-volt regulated dc source through resistors R943 and R937, and isolation diodes CR950 and CR946, to ground. This action causes switching diodes CR936 and CR935 to become reverse-biased. With diode CR935 reverse-biased, the unit's matrix is effectively disconnected from the base circuitry of the unit's amplifier. The base voltage applied to transistor Q904 is then determined only by the network consisting of resistors R920, R909, R910, and diode CR909.

4-68. Unit's amplifier Q904 serves to amplify the ten different voltages produced by the unit's matrix circuit. The gain of the amplifier is switched to four different levels by the action of transistor switches Q901, Q902, and Q903. The gain of the amplifier increases directly with the ten's digit selected. Hence, the amplifier output voltage corresponding to a frequency of 126 mc is greater than the amplifier output voltage corresponding to a frequency of 116 mc. Transistors Q901, Q902, and Q903 each switch a resistor of a different value into the collector circuit of the unit's amplifier, thus varying the collector impedance and hence the gain of the amplifier.

4-69. Transistors Q901, Q902, and Q903 function as switches controlled through the ten's matrix circuit by the code information from the ten's control wires. Transistor Q904, designated the unit's amplifier, is connected in a voltage divider arrangement with transistor switches Q901, Q902, and Q903. The voltage divider is supplied from the +50-volt dc converter, Q905, in the transceiver. When a given channel frequency is selected at the remote control unit, the switching diodes in the ten's matrix circuit switch the ten's oscillator on or off and select the appropriate unit's oscillator as described in preceding paragraphs 4-54 through 4-58. In addition, the switching diodes select either the ten's switch (Q903), the twenty's switch (Q902), or the thirty's switch (Q901), or turn all three of the switches off. This action establishes a control voltage in the collector circuits of the three transistor switches which acts in conjunction with the unit control voltage from the output of the unit's amplifier to establish the correct bias voltage applied to the tracked filters in the receiver.

4-70. Control of transistor switches Q901, Q902, and Q903, and unit oscillators Q401 and Q402, is effected in the ten's matrix circuit utilizing switching diodes CR901 through CR907. These diodes, in conjunction with resistors R901 through R908, form a voltage divider. The anode of each of the seven diodes is returned through a biasing resistor to a source of +20-volts dc in the equipment. The cathodes of diodes CR901, CR902, CR903, CR906, and CR907 are returned to switching circuits in the remote control unit. When two of the ten's control wires are grounded through action of the switching circuits in the remote control unit, the associated diodes conduct to control the state of the three transistor switches and the two unit's oscillators.

4-71. When a ground is applied to the cathodes of switching diodes CR901 and CR903 for ten's digit "1" selection, these diodes become forward-biased thereby turning off transistor switches Q901 and Q902. Ten's switch Q903 remains in conduction, and its collector current flows through resistors R915 and R912 to ground. The resultant voltage developed across resistor R915 is applied to the voltage divider formed at the collector of the unit's amplifier.

4-72. When a ground is applied to the cathodes of switching diodes CR901 and CR907 for ten's digit "2" selection, these diodes become forward-biased thereby turning off transistor switches Q901 and Q903. Twenty's switch Q902 remains in conduction, and its collector current flows through resistors R914 and R912 to ground. The resultant voltage developed across resistor R914 is applied to the voltage divider formed at the collector of the unit's amplifier.

4-73. When a ground is applied to the cathodes of switching diodes CR903 and CR907 for ten's digit "3" selection, these diodes become forward-biased thereby turning off transistor switches Q902 and Q903. Thirty's switch Q901 remains in conduction, and its collector current flows through resistors R913 and R912 to ground. The resultant voltage developed across resistor R913 is applied to the voltage divider formed at the collector of the unit's amplifier.

4-74. When a ground is applied to the cathodes of switching diodes CR903 and CR902/CR906 for ten's digit "4" selection, diodes CR903, CR902, and CR906 become forward-biased. This action causes transistor Q902 to turn off due to conduction through diode CR903, and causes transistor Q903 to turn off due to conduction through diode CR906. Transistor Q901 is switched off due to current through diode CR902. With all three transistor switches turned off, only series resistors R916 and R912 remain to load the collector circuit of the unit's amplifier.

4-75. I-F AMPLIFIER.

4-76. GENERAL. The fixed-tuned 455-kc i-f amplifier employs three stages of amplification. The common-emitter configuration is used throughout with the individual stages being capacity-coupled. The response curve of the amplifier is primarily determined by the response of the input i-f filters, FL105 and FL106. Bandwidth at the 6-db points is a minimum of 30 kc. Agc control is applied to the first stage of the amplifier.

4-77. FIRST I-F STAGE. Transistor Q201 provides amplification in the first i-f stage. Resistor R202 and I-F GAIN control R201 serve to match the output of ceramic filter FL106 to the base of transistor Q201. Control R201 provides a means of adjusting the over-all gain of the i-f amplifier as well as the agc and squelch threshold points. A network consisting of resistor R207, coil L201, and the input impedance of the following stage constitutes the collector load. The base circuit of the transistor is returned to the agc bus through resistor R206 and diode CR201. Diode R202, capacitor C205, and resistor R210 are included to provide agc control. The signal at the collector is coupled to the base of the following stage through capacitor C206.

4-78. SECOND I-F STAGE. Transistor Q202 provides amplification in the second i-f stage. The base circuit of the transistor is returned to the +20-volt regulated dc source through resistor R213. No agc control is used in the second stage. The amplified signal at the collector is coupled to the base of the third i-f stage through capacitor C209.

4-79. THIRD I-F STAGE. Transistor Q203 serves in the third (final) stage of i-f amplification. No agc control is used in the final stage. Coil L204 serves as the collector load and is returned to the +20-volt regulated dc source. Resistor R220 is connected across coil L204 to lower the Q of the coil and prevent any tendency toward oscillations. The i-f output signal is coupled to the audio detector through capacitor C212, and to the agc detector through limiting resistor R222 and capacitor C221.

4-80. AUDIO DETECTOR.

4-81. Diode CR203 detects the amplitude-modulated 455-kc i-f signal to develop the audio signal across a voltage divider consisting of resistors R223 and R221. The rf component is removed by the action of a filter network consisting of resistor R225 and capacitors C213 and C215. The detected audio signal is fed through resistor R225 and applied directly to the base of the selcal amplifier, transistor Q301.

4-82. SELCAL AMPLIFIER.

4-83. Transistor Q301 functions in a single-ended stage as the selcal amplifier. The selcal level is controlled by DATA LEVEL control R301. The selcal output signal is coupled through transformer T301 and applied to the ATCSS via pins 15 and 16 of the upper insert on equipment connector J1. The amplified receiver audio signal present at the emitter of transistor Q301 is applied to the cathode of the squelch diode. The squelch diode is reverse-biased in the absence of a readable signal. The selcal amplifier operates independent of the squelch circuit.

4-84. SQUELCH CIRCUITRY.

4-85. SQUELCH DIODE AND NOISE LIMITER. The squelch circuit employed in the Series 807 VHF Transceiver utilizes diode CR301 as a squelch gate and noise limiter. The receiver audio signal is cut off when diode CR301 is reverse-biased, or allowed to pass through when diode CR301 is forward-biased. The bias for diode CR301 is established by the condition of the squelch amplifier, transistor Q302. The emitter voltate of transistor Q301 establishes a reference for the cathode of diode CR301. Squelch amplifier Q302 is turned off in the absence of a readable signal. The resultant voltage produced at the junction of resistors R304 and R306 causes diode CR301 to be reverse-biased. When a signal of sufficient amplitude is received, squelch amplifier Q302 is switched to the saturated state. The resultant drop in voltage produced at the junction of resistors R304 and R306 causes diode CR301 to become forward-biased. With diode CR301 forward-biased, the receiver audio signal is coupled through the diode and fed through resistor R305 to the input of audio filter FL301.

4-86. Diode CR301 also functions as a noise limiter for high-amplitude positive noise peaks. When the positive noise peaks reach a level sufficient to overcome the forward bias applied to diode CR301, the diode switches off thereby clipping receiver noise at the peak audio level.

4-87. SQUELCH AMPLIFIER. Transistor Q302 serves as the squelch amplifier. The amplifier is controlled by the collector current of agc amplifier Q205. This control current is applied to the amplifier through tunnel diode CR302. With an increase in the level of a received signal, the control current through the tunnel diode increases. When a signal of sufficient amplitude is received, tunnel diode CR302 switches to the normal diode voltage curve, increasing the base-to-emitter voltage of transistor Q302. This causes transistor Q302 to become saturated, applying forward bias to diode CR301 and opening the squelch. The receiver audio signals are then passed through diode CR301 and resistor R305 to the input of audio filter FL301. The design of the squelch circuitry is such that a hard signal of approximately 3 microvolts is required to open the squelch. The squelch threshold can be adjusted internally by means of I-F GAIN control R201.

4-88. Provisions have been made in the receiver design for the use of a remote squelch disable switch as well as a remote squelch level control. Resistor R303 is connected from the squelch control bus at the collector of transistor Q205 to pin 31 of the lower insert on equipment connector J1. When the proper connections have been completed between the transceiver and the remote control unit, depressing the COMM TEST push-button switch on the remote control unit causes a ground to applied to pin 31, thereby disabling the receiver squelch action.

4-89. Coil L106 is connected from the base of third mixer transistor Q104 to pin 38 of the lower insert on connector J1. This connection provides a means by which the third mixer gain can be remotely adjusted to allow the squelch threshold to be set to the best level for certain noise environments.

4-90. RECEIVER AUDIO CIRCUITRY.

4-91. AUDIO FILTER. The receiver audio signals coupled through squelch gate diode CR301 are fed through resistor R305 and applied to the input of audio filter FL301. Resistor R305 provides an impedance match between the emitter of transistor Q301 and the input of filter FL301. Filter FL301 is designed to pass a band of frequencies from approximately 300 to 3,750 cps while attenuating other frequencies. Frequencies of 5,750 cps and higher are attenuated more than 30 db from the 1,000-cps level. A narrow filter is available when 25-kc channel spacing is utilized. This filter is designed to pass a band of frequencies from approximately 300 to 2,300 cps while attenuating other frequencies. Frequencies of 3,750 cps and higher are attenuated more than 30 db from the 1,000-cps level. Signals at the output of filter FL301 are fed through AUDIO LEVEL control R308 and coupled through capacitor C302 to the input of the audio amplifier.

4-92. AUDIO AMPLIFIER. The audio amplifier is comprised of three direct-coupled stages which provide an open-circuit gain of approximately 60 db with a total (ac and dc) negative feedback of about 40 db. A 'bootstrap' circuit is used in one of the feedback loops in order to increase the input impedance of the 'bootstrapped' stage and hence the input impedance of the amplifier as a whole. Bias stabilization techniques have been used throughout the amplifier design.

4-93. Transistor Q303 provides the first stage of amplification. Diode CR303 provides bias stabilization to correct for changes in the emitter-to-base junction resistance of transistor Q303 with temperature variations. Diode CR303 is forward-biased, with its anode connected to the base of transistor Q303 through resistor R309. The emitter return for Q303 is completed through resistor R317, which is common to the output circuitry used in the final stages of the amplifier. This arrangement provides a feedback loop to hold the gain of the amplifier at a practically constant level. Resistors R307 and R310 set the bias conditions for Q303. The amplified signal at the collector of Q303 is direct-coupled to the base of the audio driver-amplifier.

4-94. Transistor Q304 functions as the audio driver-amplifier. Resistors R312 and R311 comprise a voltage divider which tends to hold the emitter of Q304 at a constant potential. Collector current is supplied through diode CR304 and resistors R313 and R314 from the +20-volt regulated dc source in the unit. 'Bootstrapping' is provided through capacitor C305 from the output circuitry used in the final stage of the amplifier. The bootstrap network, comprised of capacitor C305 and resistors R313 and R314, is employed to increase the ac load impedance of the driver stage so as to allow a greater signal amplitude to be handled by the stage without clipping. The driver stage is direct-coupled to the audio output stage.

4-95. Transistors Q305 and Q306 function as a complementary symmetry pair for the audio output stage. Transistor Q305 is a NPN type while transistor Q306 is a PNP type. The circuit is arranged as a Class B, push-pull, emitter-follower amplifier. Operation of the circuit is such that with an input signal of a given instantaneous polarity, one transistor is biased on while the other is nonconducting. As the polarity of the input signal reverses, the first transistor is reverse-biased while the second conducts. Diode CR304 prevents cross-over distortion. The gain of the three-stage amplifier is determined by the ratio of the value of resistor R316 to that of resistor R317. This is evident by the fact that the output signal at the junction of resistors R315 and R316 is impressed across a voltage divider formed by R316 and R317. Since the emitter of transistor Q303 is connected to the junction of R316 and R317, the input of the amplifier samples the output. Resistor R316 and shunt capacitor C306 form a network which serves to attenuate high audio frequencies above 6,000 cycles. Auxiliary PHONE jack J3, located on the front panel of the transceiver, is connected across the primary winding of audio output transformer T302. The audio output signal is coupled through capacitor C307 and transformer T302, and fed to pins 35 and 36 of the lower insert on equipment connector J1. Transformer T302 is designed to operate into a nominal output load of 500 ohms. However, proper operation can be afforded when the transformer is terminated in load impedances ranging from 200 ohms to infinity.

4-96. A control circuit is incorporated in the audio driver and output stages for the purpose of disabling the receiver audio whenever the Comm Disable line is grounded or the motor-positioner mechanism in the transmitter is in operation. The anodes of diodes CR305 and CR306 are connected to the collector of audio driver amplifier Q304 and to the base of audio output amplifier Q306. The cathode of diode CR306 is connected to the remote Comm Disable line via pin 13 of the upper insert on equipment connector J1. When the remote Comm Disable line is grounded, diode CR306 conducts effectively grounding the collector of transistor Q304 and the base of transistor Q306 thus disabling the receiver audio signal. The cathode of diode CR305 is connected to contacts on relay K2004. Whenever the motor-positioner mechanism in the transmitter is in operation, relay K2004 is energized and a ground is applied to the cathode of diode CR305 through contacts provided on the relay. This disables the receiver audio signal during the tuning-in-process function in the manner previously described.

4-97. AGC CIRCUITRY.

4-98. Diode CR205 serves as the agc detector while transistors Q205 and Q204 perform amplification and output functions, respectively. The modulated 455-kc signal is fed through a limiting resistor (R222) and coupled through capacitor C221 to the input of the agc detector, diode CR205. Coil L207 supplies the dc return for diode CR205, while maintaining a high input impedance to the detector. Limiting resistor R222 prevents the agc circuit from loading the final i-f stage in addition to preventing transistor Q205 from being overdriven. The detected output from diode CR205 is proportional to signal strength above the threshold level of the diode, and is used to base-bias transistor Q205. Transistor Q205 is arranged in an emitter-follower configuration to drive agc output transistor Q204, which has its emitter returned through a diode (CR204) to the +20-volt regulated dc source in the equipment. Under no-signal conditions, the bias circuits of the two transistors are arranged so that Q205 is turned off while Q204 is saturated. In this condition, the forward-bias supplied to the agc-controlled stages is of such a value that these stages are operated at maximum sensitivity.

4-99. With a received signal, the base of transistor Q205 is driven positive, and the conduction of the transistor increases. This causes the base of transistor Q204 to be driven in a positive direction, out of saturation, and hence the emitter-to-collector resistance of Q204 to increase. Under this condition, the collector output voltage (forward agc supply) is reduced, which results in lowering the gain of the agc-controlled stages.

4-100. The collector current of transistor Q205 is used to control squelch amplifier Q302. Operation of the squelch circuitry has been covered in preceding paragraphs 4-84 through 4-89.

4-101. The agc voltage present at the collector of agc output transistor Q204 is fed through resistor R227, filtered, and applied to the controlled stages in the receiver. Resistor R227 together with capacitors C216, C217, and C218 establish the proper time constant. Capacitor C218 provides out-of-phase cancellation for any ripple voltage that might be present on the agc bus. Agc control voltage is applied to the rf amplifier, first mixer, and first i-f amplifier stage.

4-102. METERING CIRCUITS.

4-103. Provision has been made to monitor a voltage representative of agc action in the receiver. When the meter switch on the front panel of the transceiver is set in the AGC position, this voltage is applied to the front panel meter via resistor R226 and contacts of the meter switch.

4-104. TRANSMITTER THEORY.

4-105. GENERAL.

4-106. The transmitter is capable of delivering a minimum carrier output of 25 watts on either cw or phone operation. Five crystal-controlled oscillators, a frequency doubler, an injection amplifier, and three mixers form the transmitter frequency conversion system. Accurate frequency selection is accomplished by means of switching diodes that are activated by the remote control unit. Four varactor-tuned filters are employed in injection and rf amplifier stages. Output of the conversion system, which is at the carrier frequency, is amplified in succession by the rf amplifier, rf exciter amplifier, driver-amplifier, and power amplifier and then applied to the antenna. Voice and data input signals used to modulate the transmitter carrier are amplified to the required level by self-contained modulator stages. Transmitter output is monitored by an integral sidetone circuit. For complete transmitter circuit details, refer to the schematic diagram in figure 7-1.

4-107. TRANSMITTER BLOCK DIAGRAM.

4-108. A block diagram of the transmitter is shown in figure 4-3. Note that the outputs of some oscillators and mixers on this block diagram are shown as a range of frequencies. However, for any particular transmitter channel selected, only one specific frequency within each range is present at these points in the synthesis scheme.

4-109. Either high unit's oscillator Q401 or low unit's oscillator Q402 is selected for operation when a given transmitter channel is selected at the remote control unit. Output of the selected unit's oscillator is doubled in frequency by frequency doubler Q105, and the resultant signal is fed to the input of first injection mixer Q106. Output of ten's oscillator Q501 is also applied to first injection mixer Q106. The ten's oscillator operates on a frequency of 10.000 mc only when the selected transmitter channel falls in certain ranges. Output of the first injection mixer is applied to 'tracked' filter FL108. The signal at the output of filter FL108 is coupled to the input of injection amplifier Q107. The amplified signal at the output of Q107 is applied to 'tracked' filter FL109. The signal at the output of filter FL109 is applied to third injection mixer Q101. Filters FL108 and FL109 are tracked (by means of a bias voltage obtained from the bias tuning matrix) to pass either the sum, difference, or fundamental output products of the first injection mixer, depending on the range in which the selected channel frequency falls.

4-110. Output from tenth's mc oscillator Q602 and the output from hundredth's mc oscillator Q702 are both fed into second injection mixer Q109. The difference product appearing in the output of Q109 is fed through filter FL111 and applied to third injection mixer Q101.

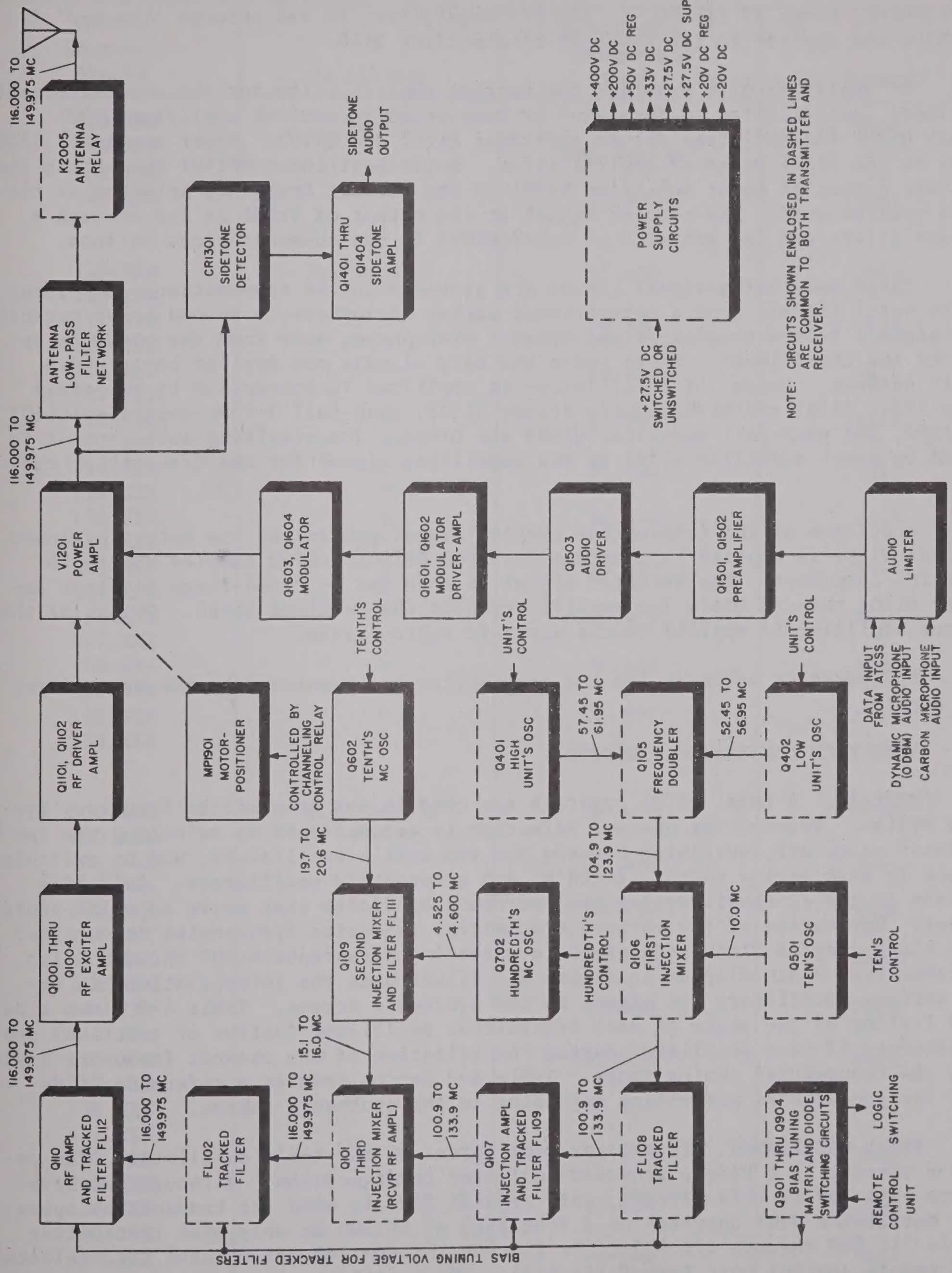

116.000 TO 149.975 MC
K2005 ANTENNA RELAY
ANTENNA LOW-PASS FILTER NETWORK
116.000 TO 149.975 MC
V1201 POWER AMPL
Q1101, Q1102 RF DRIVER AMPL
Q1001 THRU Q1004 RF EXCITER AMPL
116.000 TO 149.975 MC
Q110 RF AMPL AND TRACKED FILTER FL112
CR1301 SIDETONE DETECTOR
Q1401 THRU Q1404 SIDETONE AMPL
SIDETONE AUDIO OUTPUT
Q1603, Q1604 MODULATOR
MP1901 MOTOR-POSITIONER
CONTROLLED BY CHANNELING CONTROL RELAY
116.000 TO 149.975 MC
FL102 TRACKED FILTER
Q1601, Q1602 MODULATOR DRIVER-AMPL
TENTH'S CONTROL
Q602 TENTH'S MC OSC
19.7 TO 20.6 MC
Q109 SECOND INJECTION MIXER AND FILTER FL111
15.1 TO 16.0 MC
116.000 TO 149.975 MC
Q101 THIRD INJECTION MIXER (RCVR RF AMPL)
Q1503 AUDIO DRIVER
UNIT'S CONTROL
Q401 HIGH UNIT'S OSC
4.525 TO 4.600 MC
Q702 HUNDREDTH'S MC OSC
HUNDREDTH'S CONTROL
100.9 TO 133.9 MC
Q107 INJECTION AMPL AND TRACKED FILTER FL109
57.45 TO 61.95 MC
Q105 FREQUENCY DOUBLER
104.9 TO 123.9 MC
Q106 FIRST INJECTION MIXER
100.9 TO 133.9 MC
FL108 TRACKED FILTER
Q1501, Q1502 PREAMPLIFIER
UNIT'S CONTROL
52.45 TO 56.95 MC
Q402 LOW UNIT'S OSC
10.0 MC
Q501 TEN'S OSC
TEN'S CONTROL
Q901 THRU Q904 BIAS TUNING MATRIX AND DIODE SWITCHING CIRCUITS
LOGIC SWITCHING
REMOTE CONTROL UNIT
BIAS TUNING VOLTAGE FOR TRACKED FILTERS
AUDIO LIMITER
DATA INPUT FROM ATCSS
DYNAMIC MICROPHONE (0 DBM) AUDIO INPUT
CARBON MICROPHONE AUDIO INPUT
POWER SUPPLY CIRCUITS
+400V DC
+200V DC
+50V DC REG
+33V DC
+27.5V DC
+27.5V DC SUPPR
+20V DC REG
-20V DC
+27.5V DC SWITCHED OR UNSWITCHED
NOTE: CIRCUITS SHOWN ENCLOSED IN DASHED LINES ARE COMMON TO BOTH TRANSMITTER AND RECEIVER.

Figure 4-3. Transmitter Block Diagram

4-111. Third injection mixer Q101 combines the output signal of filter FL111 with the output signal of 'tracked' filter FL109. The sum product that appears at the output of Q101 is at the transmitter carrier frequency. This carrier signal, in the frequency range of 116.000 to 149.975 megacycles, is fed through 'tracked' filter FL102 and applied to the input of rf amplifier Q110.

4-112. Rf amplifier Q110 provides the initial amplification for the carrier signal. Additional amplification is furnished by four-stage rf exciter amplifier Q1001 through Q1004 and two-stage driver-amplifier Q1101 and Q1102. Power amplifier V1201 serves as the final stage of amplification. Motor-positioner MP1901 tunes both the input and output of power amplifier V1201 to the carrier frequency selected at the remote control unit. The carrier signal at the output of V1201 is fed through a low-pass filter and the contacts of relay K2005 to the communications antenna.

4-113. Three modulating-signal inputs are provided in the transmitter. One input accepts voice signals from a conventional carbon microphone; a second input accepts voice signals from a transistorized dynamic microphone; data from the ATCSS is applied to the third input. These voice and data signals are applied to an audio limiter network. Output of this limiter is amplified in succession by two-stage preamplifier Q1501 and Q1502, audio driver Q1503, push-pull driver-amplifier Q1601 and Q1602, and push-pull modulator Q1603 and Q1604. The resulting audio output is applied to power amplifier V1201 as the modulating signal for the transmitter carrier.

4-114. A portion of the transmitter carrier signal present at the output of power amplifier V1201 is applied to sidetone detector CR1301, which samples the audio modulation component. The detected signal is then fed to three-stage sidetone amplifier Q1401 through Q1404 for amplification to the required level. Output of the sidetone amplifier is applied to the aircraft audio system.

4-115. Dc operating voltages for the transmitter are furnished by the transceiver power supply.

4-116. FREQUENCY CONVERSION CIRCUITS.

4-117. **GENERAL.** A total of 35 crystals are used in the transmitter frequency synthesis system. Transmitter channel selection is accomplished by switching the ten's oscillator on or off, switching between the two unit's oscillators, and by switching crystals in each active unit's, tenth's, and hundredth's oscillators. Switching functions in the synthesis system are performed by diodes that serve as solid-state switches. Derivation of the various transmitter injection frequencies is outlined in the block diagram discussion given in preceding paragraphs 4-107 through 4-115. The transmitter block diagram in figure 4-3 illustrates the interrelationship between various oscillators and mixers in the synthesis scheme. Table 4-2 gives a detailed listing of the state of each transmitter oscillator (active or inactive) and the frequency of each oscillator during the selection of any channel frequency digit within the transmitter tuning range. Table 4-2 can be used as a reference in deriving the frequencies present at any point in the synthesis scheme.

4-118. **TEN'S OSCILLATOR.** Transistor Q501 serves as the ten's oscillator. The oscillator circuit is a Pierce grounded-collector configuration. Although two crystals are employed in this circuit, only crystal Y501 is used for transmitter operation. Oscillator Q501 operates on a frequency of 10.000 mc only when transmitter channels 116.000 through 119.975 mc or 140.000 through 149.975 mc have been selected at the remote control unit (see Table 4-2). The oscillator is inoperative over the transmitter frequency range of 120.000 to 139.975 mc. Oscillator Q501 is turned off

TABLE 4-2. TRANSMITTER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Crystal
11X.XXX	Ten's	10.000	Y501
12X.XXX	"	Not Active	--
13X.XXX	"	" "	--
14X.XXX	"	10.000	Y501
110.XXX	Low Unit's	52.450	Y418
120.XXX	" "	"	"
111.XXX	" "	52.950	Y411
121.XXX	" "	"	"
112.XXX	" "	53.450	Y416
122.XXX	" "	"	"
113.XXX	" "	53.950	Y412
123.XXX	" "	"	"
114.XXX	" "	54.450	Y419
124.XXX	" "	"	"
115.XXX	" "	54.950	Y413
125.XXX	" "	"	"
116.XXX	" "	55.450	Y417
126.XXX	" "	"	"
117.XXX	" "	55.950	Y414
127.XXX	" "	"	"
118.XXX	" "	56.450	Y420
128.XXX	" "	"	"
119.XXX	" "	56.950	Y415
129.XXX	" "	"	"
130.XXX	High Unit's	57.450	Y408
140.XXX	" "	"	"
131.XXX	" "	57.950	Y401
141.XXX	" "	"	"
132.XXX	" "	58.450	Y406
142.XXX	" "	"	"
133.XXX	" "	58.950	Y402
143.XXX	" "	"	"
134.XXX	" "	59.450	Y409
144.XXX	" "	"	"
135.XXX	" "	59.950	Y403
145.XXX	" "	"	"
136.XXX	" "	60.450	Y407
146.XXX	" "	"	"
137.XXX	" "	60.950	Y404
147.XXX	" "	"	"
138.XXX	" "	61.450	Y410
148.XXX	" "	"	"
139.XXX	" "	61.950	Y405
149.XXX	" "	"	"

TABLE 4-2 (CONT). TRANSMITTER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Crystal
1XX.0XX	Tenth's Mc	19.700	Y618
1XX.1XX	" "	19.800	Y611
1XX.2XX	" "	19.900	Y616
1XX.3XX	" "	20.000	Y612
1XX.4XX	" "	20.100	Y619
1XX.5XX	" "	20.200	Y613
1XX.6XX	" "	20.300	Y617
1XX.7XX	" "	20.400	Y614
1XX.8XX	" "	20.500	Y620
1XX.9XX	" "	20.600	Y615
1XX.X00	Hundredth's Mc	4.600	Y706
1XX.X25	" "	4.575	Y705
1XX.X50	" "	4.550	Y707
1XX.X75	" "	4.525	Y708
Example Frequencies:			
116.000	Ten's	10.000 ①	
	Low Unit's	55.450	
	High Unit's	Not Active	
	Tenth's Mc	19.700	
	Hundredth's Mc	4.600	
119.975	Ten's	10.000 ①	
	Low Unit's	56.950	
	High Unit's	Not Active	
	Tenth's Mc	20.600	
	Hundredth's Mc	4.525	
120.000	Ten's	Not Active	
	Low Unit's	52.450	
	High Unit's	Not Active	
	Tenth's Mc	19.700	
	Hundredth's Mc	4.600	
129.975	Ten's	Not Active	
	Low Unit's	56.950	
	High Unit's	Not Active	
	Tenth's Mc	20.600	
	Hundredth's Mc	4.525	

TABLE 4-2 (CONT). TRANSMITTER FREQUENCY SYNTHESIS

Channel Frequency Digits	Oscillator	Oscillator Frequency (mc)	Crystal
Example Frequencies (Cont):			
130.000	Ten's	Not Active	
	Low Unit's	Not Active	
	High Unit's	57.450	
	Tenth's Mc	19.700	
	Hundredth's Mc	4.600	
139.975	Ten's	Not Active	
	Low Unit's	Not Active	
	High Unit's	61.950	
	Tenth's Mc	20.600	
	Hundredth's Mc	4.525	
140.000	Ten's	10.000 ②	
	Low Unit's	Not Active	
	High Unit's	57.450	
	Tenth's Mc	19.700	
	Hundredth's Mc	4.600	
149.975	Ten's	10.000 ②	
	Low Unit's	Not Active	
	High Unit's	61.950	
	Tenth's Mc	20.600	
	Hundredth's Mc	4.525	

① Ten's oscillator frequency subtracted from output of frequency doubler to arrive at output of first injection mixer.

② Ten's oscillator frequency added to output of frequency doubler to arrive at output of first injection mixer.

when the C10 control wire is grounded through action of the channel selection circuits. Crystal Y501 is operated at parallel resonance on its fundamental frequency. Feedback occurs in the transistor oscillator from emitter to base, through the tank circuit formed by the inductance of the selected crystal and the circuit capacities. Circuit capacities are chosen so as to establish proper crystal loading conditions while providing the correct transistor impedance match. Resistors R505, R507, and R509 establish the proper starting bias conditions. Oscillator output at the emitter of Q501 is coupled through capacitor C506 and coil L120 to the emitter of first injection mixer Q106. Capacitors C505 and C125 and coil L120 comprise a low-pass filter that attenuates higher-order harmonics of the oscillator.

4-119. LOW UNIT'S OSCILLATOR. Transistor Q402 is employed as the low unit's oscillator. A colpitts common-emitter circuit configuration is used with the selected crystal in the feedback path from base to collector (ground). Ten Type CR67/U low temperature coefficient crystals (Y411 through Y420) are switched in a "two-out-of-five" (2 x 5) biased-diode switching circuit. Each crystal is mounted in a Type HC-18/U holder which plugs into the oscillator circuitry. Crystal operating frequencies are spaced 500 kc apart in the range of 52.45 to 56.95 mc. The selected crystal is operated at series resonance on the fifth overtone mode of the crystal fundamental frequency. Oscillator Q402 operates only when channel frequencies 116.000 through 129.975 mc have been selected at the remote control unit and is inoperative over the channel frequency range of 130.000 to 149.975 mc (see Table 4-2). Oscillator Q402 is turned off when the B10 and C10 control wires are grounded, or when the B10 and D10 control wires are grounded, through the action of the channel selection circuits. Control wires B10, C10, and D10 are combined in the diode switching circuitry to form a single control wire which is routed to the low unit's oscillator. This control wire provides a switching function exactly opposite to that provided by the A10 control wire discussed with the high unit's oscillator. A tuned pi-network tank circuit is employed in the collector of transistor Q402 to provide the necessary 180-degree phase reversal (in respect to the base) required for sustained oscillations. Variable inductor L402 tunes the tank circuit for optimum oscillator performance. Capacitor C408 and resistor R408 match the output load to the oscillator. Oscillator output is coupled from the tank circuit by capacitor C406 and is applied to the base of frequency doubler transistor Q105 through isolation resistor R435.

4-120. HIGH UNIT'S OSCILLATOR. Transistor Q401 is employed as the high unit's oscillator. The oscillator circuit is identical to that used for the low unit's oscillator. Ten crystals (Y401 through Y410) are switched in the oscillator. Operating frequencies of the crystals are spaced 500 kc apart in the range of 57.45 to 61.95 mc. The selected crystal is operated on the fifth overtone mode of the crystal fundamental frequency. Oscillator Q401 operates only when channel frequencies 130.000 through 149.975 mc have been selected at the remote control unit (see Table 4-2). Oscillator Q401 is inoperative over the channel frequency range of 116.000 to 129.975 mc. The high unit's oscillator is turned off when the A10 control wire is grounded through the action of the channel selection circuits. Variable inductor L401 tunes the oscillator tank circuit for optimum oscillator performance. Oscillator output is coupled from the tank circuit by capacitor C401 and applied to the base of frequency doubler transistor Q105 through isolation resistor R434.

4-121. FREQUENCY DOUBLER. Transistor Q105 serves as the frequency doubler. Output of the active unit's oscillator is applied to the base of transistor Q105. Resistors R434 and R435 provide isolation between the two unit oscillator circuits. Filter FL107, in the output of Q105, is a hermetically sealed unit designed to pass a range of frequencies from 104.9 to 123.9 mc. The second-order harmonic of the 52.45 to 61.95 mc input signal that appears at the collector of transistor Q105 is passed through filter FL107 and applied to the base of first injection mixer Q106.

4-122. FIRST INJECTION MIXER. Transistor Q106 is employed as the first injection mixer. The frequency doubler output signal obtained from filter FL107 is direct-coupled to the base of Q106. Resistors R130 and R129 constitute a voltage divider to supply the proper base bias to transistor Q106 from the +20-volt regulated dc supply. The ten's oscillator output signal is applied to the emitter of Q106.

4-123. Since the injection frequencies applied to the first injection mixer vary over a wide range, a 'tracked' filter is employed in the output of the mixer to maintain proper tuning. Tracked filter FL108 is similar in construction to tuned filters FL101 and FL102 used in the receiver rf amplifier circuitry. Filter FL108 is 'tracked' (tuned) during the channel selection process by means of a predetermined level of bias voltage obtained from the bias tuning matrix. Output of FL108 is applied to the base of injection amplifier Q107.

4-124. Injection signals from the output of frequency doubler Q105 and ten's oscillator Q501 are combined in the first injection mixer over the channel frequency range of 116.000 to 119.975 mc. Over this range of channel frequencies, filter FL108 is 'tracked' to pass the difference frequency of the two injection signals. Only the output of frequency doubler Q105 is applied to the first injection mixer over the channel frequency range of 120.000 to 129.975 mc. Over this range of channel frequencies, filter FL108 is 'tracked' to pass only the doubled output of the low unit's oscillator. Only the output of frequency doubler Q105 is applied to the first injection mixer over the channel frequency range of 130.000 to 139.975 mc. Over this range of channel frequencies, filter FL108 is 'tracked' to pass only the doubled output of the high unit's oscillator. Injection signals from the output of frequency doubler Q105 and ten's oscillator Q501 are combined in the first injection mixer over the channel frequency range of 140.000 to 149.975 mc. Over this range of channel frequencies, filter FL108 is 'tracked' to pass the sum frequency of the two injection signals.

4-125. INJECTION AMPLIFIER. Transistor Q107 functions as the injection amplifier. The first injection mixer output signal obtained from 'tracked' filter FL108 is coupled through capacitor C124 to the base of transistor Q107. Resistors R124 and R122 establish the proper base bias for Q107. Output of the injection amplifier, in the range of 100.900 to 133.900 mc, is fed through 'tracked' filter FL109 and coupled to the base of third injection mixer Q101 through capacitors C144 and C147, switching diode CR103, and resistor R138. Switching diode CR102 is reverse biased in the transmit mode to isolate the injection amplifier output signal from the receiver circuits. Filter FL109 is similar in construction and operation to filter FL108 in the output of first injection mixer Q106.

4-126. TENTH'S MC OSCILLATOR. Transistor Q602 serves as the tenth's mc oscillator. Circuit operation is similar to the low (or high) unit's oscillator. No tuned circuit is used. Ten Type CR69/U crystals (Y611 through Y620) are switched in a '2 x 5' biased-diode switching circuit. Each crystal is mounted in a Type HC-18/U holder which plugs into the oscillator circuitry. Operating frequencies of the ten crystals are spaced 100 kc apart in the range of 19.700 to 20.600 mc. The selected crystal is operated at parallel resonance on its fundamental frequency. Oscillator Q602 operates from the +20-volt regulated dc supply in the transceiver. Application of this +20-volt potential is controlled by power control relay K2002. Oscillator output is fed from the emitter of transistor Q602 through filter and coupling networks to the base of second injection mixer Q109.

4-127. HUNDREDTH'S MC OSCILLATOR. Transistor Q702 functions as the hundredth's mc oscillator. Circuit operation is identical to the tenth's mc oscillator except for the number of crystals switched and the different frequency range covered. Four Type CR69/U crystals (Y705 through Y708) are switched in the hundredth's oscillator circuit. Operating frequencies of the four crystals are spaced 25 kc apart in the range of 4.525 to 4.600 mc. The selected crystal is operated at parallel resonance on its fundamental frequency. Oscillator Q702 operates from the +20-volt regulated dc supply. Application of this +20-volt potential is controlled by power control relay K2002. Oscillator output is fed from the emitter of transistor Q702 through filter and coupling networks to the base of second injection mixer Q109.

4-128. SECOND INJECTION MIXER. Transistor Q109 is employed as the second injection mixer. The output of tenth's mc oscillator Q602, in the range of 19.700 to 20.600 mc, and the output of hundredth's mc oscillator Q702, in the range of 4.525 to 4.600 mc, are both applied to the base of transistor Q109. Capacitor C606, coil L121, and capacitor C140 serve as a low-pass pi filter that rejects second- and higher-order harmonics of the tenth's mc oscillator. Resistor R137 provides the correct terminating impedance for the pi filter. Capacitors C605 and C132 provide the coupling in the tenth's mc oscillator signal path and resistor R143 attenuates this signal to establish the proper injection level. Capacitor C706, coil L114, and capacitor C131 serve as a low-pass pi filter that rejects second- and higher-order harmonics of the hundredth's mc oscillator. Resistor R139 provides the correct terminating impedance for the pi filter. Capacitors C705 and C132 provide the coupling in the hundredth's mc oscillator signal path and resistor R140 attenuates this signal to establish the proper injection level. Resistors R142 and R141 constitute a voltage divider to supply the proper base bias to transistor Q109. The sum and difference products appearing in the collector circuit of transistor Q109 are applied to the input of filter FL111, which separates the difference component to develop a filtered injection signal for third injection mixer Q101. Filter FL111 is a fixed-tuned band-pass device contained in a hermetically sealed case. The filter has a center frequency of about 15.500 mc with approximately a one-megacycle bandpass which extends from 15.100 to 16.000 mc. Output of filter FL111 is applied directly to the emitter of third injection mixer Q101.

4-129. THIRD INJECTION MIXER. Transistor Q101 serves as the third injection mixer. Switching diode CR101 is forward biased in the transmit mode by the application of a negative potential to the cathode through current limiting resistor R1817. The anode of diode CR101 and the input of filter FL101 are grounded through contacts on antenna relay K2005. Diode CR101 and capacitor C146 shunt to ground any rf signals present at the input of filter FL101 to prevent the possibility of oscillations. Output of injection amplifier Q107, in the range of 100.900 to 133.900 mc, is fed through 'tracked' filter FL109 and coupled to the base of transistor Q101. Output of second injection mixer Q109, in the range of 15.100 to 16.000 mc, is fed through filter FL111 to the emitter of Q101. The sum product of these injection signals, in the range of 116.000 to 149.975 mc, appears at the collector of transistor Q101 as the transmitter carrier frequency. This carrier signal is applied to 'tracked' filter FL102. Output of filter FL102 is coupled to rf amplifier Q110. Transistor Q102 is reverse biased in the transmit mode to prevent the carrier signal from entering the receiver circuits.

4-130. CHANNEL SELECTION CIRCUITS.

4-131. Transmitter channel selection is accomplished in essentially the same manner and by means of much of the same circuitry as the receiver channel selection discussed in preceding paragraphs 4-52 through 4-74. Therefore, only the important differences presented by the transmitter channel selection circuitry will be commented on here. In the transmit mode of operation, crystal Y501 is selected for use in ten's oscillator Q501 by the application of the +20-volt dc regulated potential to resistor R506. Transistor Q602 serves as the transmitter tenth's mc oscillator, with diodes CR611 through CR620 providing the rf switching functions. Except for the crystal frequencies involved, this stage operates exactly as receiver tenth's mc oscillator Q601. Transistor Q702 serves as the transmitter hundredth's mc oscillator, with diodes CR705 through CR708 providing the rf switching functions. Except for the crystal frequencies involved, this stage operates exactly as receiver hundredth's mc oscillator Q701. References to the application of bias tuning voltage to 'tracked' filters in the receiver apply equally to 'tracked' filters FL102, FL108, FL109, and FL112 in the transmitter circuits.

4-132. Simultaneous with the selection of a transmitter channel frequency, motor-positioner MP1901 drives the rotors of switches S1101 and S1201 until contacts on these switches connect tuning coils of the appropriate frequency range into the grid and plate circuits of power amplifier V1201. Any one of seven adjustable tuning coils L1106 through L1112 can be selected for connection into the grid circuit of power amplifier V1201 by the contacts on switch S1101. Any one of seven adjustable tuning coils L1204 through L1210 can be selected for connection into the plate circuit of V1201 by the contacts on switch S1201. Each grid coil is paired with a complementary plate coil that covers the same tuning range. The frequency range of each coil is shown on the schematic diagram in figure 7-1. Through the use of the coil pairs, the transmitter tuning range is effectively separated into four frequency bands. Only one coil pair is employed to cover the lowest frequency band. Each of the other three bands utilizes two coil pairs, one pair to cover the lower frequency range within the band and the other pair to cover the upper frequency range. The ten's digital information supplied by the remote control unit determines which frequency band is selected to tune power amplifier V1201. Selection of the frequency range within the chosen band is determined by the unit's digital information. Because of the close interrelationship involved, the detailed account of how motor-positioner MP1901 operates is presented in the transceiver control circuit discussion.

4-133. RF CARRIER SIGNAL CIRCUITS.

4-134. **RF AMPLIFIER.** Transistor Q110 provides initial amplification for the low-level carrier-frequency signal received from third injection mixer Q101. The input signal is fed through 'tracked' filter FL102 and coupling capacitor C106 to the base of transistor Q110. Output of the rf amplifier is fed through 'tracked' filter FL112 and coupled to the input stage of the rf exciter amplifier.

4-135. **RF EXCITER AMPLIFIER.** Transistors Q1001 through Q1004 function as a four-stage cascaded wide-band amplifier to provide additional amplification for the carrier-frequency signal received from rf amplifier Q110. Each stage is arranged in a common-emitter configuration with a triple-tuned output. The input signal is fed through 'tracked' filter FL112 and coupling capacitor C1001 to the base of transistor Q1001. Output from transistor Q1004 is applied to the input stage of the driver-amplifier.

4-136. Provision for ATCSS keying of the transmitter carrier is included in the rf exciter amplifier circuit. During standard voice transmission, diode CR1001 is reverse biased by the positive dc voltage applied to the cathode through resistor R1010. The junction of diode CR1001 and resistor R1010 is connected to pin 29 on the upper insert of receptacle J1 at rear of transceiver. When the ATCSS key applies a ground to pin 29, diode CR1001 is forward biased, effectively grounding one end of resistor R1002. Transistor Q1001 is then biased to cutoff and the transmitter carrier is interrupted.

4-137. **DRIVER-AMPLIFIER.** Transistors Q1101 and Q1102 are employed as a two-stage wide-band amplifier to further amplify the carrier signal received from rf exciter amplifier Q1001 through Q1004. Both stages are arranged in a grounded-emitter configuration, with transistor Q1101 serving as a double-tuned first stage and transistor Q1102 as a single-tuned second stage. Output from transistor Q1102 is used to drive power amplifier V1201.

4-138. **POWER AMPLIFIER.** Beam-power tetrode tube V1201 serves as a Class C power amplifier stage to increase the signal received from driver-amplifier Q1101 and Q1102. Coils L1106 through L1112, switch S1101, switch S1201, coils L1204 through L1210 and motor-positioner MP1901 are employed to tune the grid and plate circuits of power amplifier V1201 to the frequency selected by the remote control unit. A detailed explanation of how this tuning is accomplished is given in paragraph 4-132. Adjustable capacitor C1208 permits proper rf loading of the output circuit. Negative bias voltage for the power amplifier grid and dc operating voltages for the plate and screen grid are applied only when the microphone push-to-talk switch is pressed. Modulating voltages for the rf carrier are supplied to the plate and screen grid of V1201 from the upper and center output windings on modulation transformer T1601. Filament voltage for V1201 is furnished from the +27.5-volt dc primary power source through parallel resistors R1701 and R1702.

4-139. The rf carrier output of power amplifier V1201 is applied to a three-section low-pass antenna filter network that is designed to reject second- and higher-order harmonics of the carrier frequency. Output of the filter network, at a minimum carrier power level of 25 watts, is applied to the communications antenna through mating connectors J1301/P2004 and P2001/J2001, contacts on antenna relay K2005, mating connectors J2002/P2002, and pin A1 on the lower insert of receptacle J1 at rear of transceiver. Antenna relay K2005 is energized only during the transmit mode of operation.

4-140. MODULATOR CIRCUITS.

4-141. **GENERAL.** Audio signals used to modulate the transmitter carrier are applied to a preamplifier through any one of three inputs: a 100-ohm ATCSS data input, a 500-ohm dynamic microphone input, or a 100-ohm carbon microphone input. Data from the ATCSS is fed through transformer T1501, DATA LEVEL control R1505, and resistor R1506. Voice signals from a transistorized dynamic microphone pass through transformer T1502, 0 DB LEVEL control R1507, and resistor R1508. Voice signals from a conventional carbon microphone enter through transformer T1503, MIC LEVEL control R1509, and resistor R1510. Auxiliary MIKE jack J2, located on the transceiver front panel, permits the direct use of a carbon microphone to accomplish voice modulation. Signals from all three inputs are routed to preamplifier Q1501 and Q1502 through a common path provided by coupling capacitors C1504 and C1506 and resistor R1515. Operating voltage for all modulator stages is applied only when the microphone push-to-talk switch is pressed.

4-142. **AUDIO LIMITER.** Diodes CR1501 through CR1504, MOD LEVEL control R1512, resistors R1513 and R1516, and capacitors C1507 and C1508 serve as the active elements of a limiter network that is designed to prevent overmodulation of the transmitter carrier. A positive potential is applied through resistor R1513 and MOD LEVEL control R1512 to the cathode of diode CR1501. Control R1512 establishes the level at which limiting will occur.

4-143. The positive half cycle of the signal voltage obtained from the feedback winding on the secondary of modulation transformer T1601 is passed by diode CR1504 and applied to the anode of diode CR1502. Resistor R1516, diode CR1503, and capacitors C1507 and C1508 serve as a time-constant network that maintains modulator recovery time within prescribed limits. When the modulator feedback voltage exceeds the preset level established by MOD LEVEL control R1512, the dynamic impedance of limiter diodes CR1501 and CR1502 decreases and causes a portion of the audio input signal to be passed to ground.

4-144. PREAMPLIFIER. Transistors Q1501 and Q1502 serve as a two-stage amplifier to provide the initial amplification for the audio signal passed by the limiter network. Both stages are arranged in a common-emitter configuration and operate as Class A amplifiers. The input signal is fed through capacitor C1506 and resistor R1515 to the base of transistor Q1501. Feedback from collector to base of Q1501 is applied through resistor R1517. Signals on the collector of transistor Q1501 are coupled to the base of transistor Q1502 through capacitor C1510. Output from transistor Q1502 is direct-coupled to audio driver Q1503.

4-145. AUDIO DRIVER. Transistor Q1503 is employed as a common-emitter Class A amplifier stage to increase the signal received from preamplifier Q1501 and Q1502. Approximately 18 db of feedback is applied from the feedback winding on modulation transformer T1601 to the emitter of transistor Q1503. Resistors R1525 and R1526 and capacitors C1512 and C1513 establish the feedback level and modulator audio frequency response. Feedback from collector to base is applied through capacitor C1511 to prevent high-frequency oscillations. Output from transistor Q1503 is coupled through transformer T1504 to modulator driver-amplifier Q1601 and Q1602.

4-146. MODULATOR DRIVER-AMPLIFIER. Transistors Q1601 and Q1602 function as a Class B push-pull amplifier that matches the output impedance of the audio driver stage to the input impedance of the modulator stage. Both transistors are arranged in a common-collector configuration. Input signals from the secondary of transformer T1504 are applied directly to the bases of transistors Q1601 and Q1602. Diode CR1505 eliminates crossover distortion in the modulator. Output from transistors Q1601 and Q1602 is direct-coupled to modulator Q1603 and Q1604.

4-147. MODULATOR. Transistors Q1603 and Q1604 are employed as a Class B push-pull amplifier to provide the final amplification for the audio signals that are to be impressed on the transmitter carrier. Both transistors are arranged in a common-emitter configuration. Output from transistors Q1603 and Q1604 is applied to the primary of modulation transformer T1601. Modulating voltages are supplied to the plate circuit of power amplifier V1201 from the top secondary winding of transformer T1601 and to the screen circuit of V1201 from the center winding of T1601. The output capability of the modulator is approximately 45 watts.

4-148. SIDETONE CIRCUITS.

4-149. SIDETONE DETECTOR. Diode CR1301 serves as the sidetone detector. A sample of the amplitude-modulated transmitter carrier signal is applied to diode CR1301 through resistor R1301. Capacitor C1308 removes the rf component of the carrier signal. The detected audio signal is developed across the voltage divider formed by SIDETONE LEVEL control R1401 and resistor R1403. Control R1401 applies the audio signal to the sidetone amplifier through coupling capacitor C1401.

4-150. SIDETONE AMPLIFIER. The sidetone amplifier consists of three direct-coupled transistor stages that provide an open-circuit gain of approximately 60 db with a total (ac and dc) negative feedback of about 40 db. A 'bootstrap' circuit is used in one of the feedback loops in order to increase the input impedance of the 'bootstrapped' stage and thus the input impedance of the amplifier as a whole. Bias stabilization techniques have been used throughout the amplifier design.

4-151. Transistor Q1401 provides the first stage of amplification. Diode CR1401 provides bias stabilization to correct for changes in the emitter-to-base junction resistance of transistor Q1401 with temperature variations. Diode CR1401 is forward-biased, with the anode connected to the base of Q1401. The emitter return for Q1401 is completed through resistor R1407, which is common to the output circuitry used in the final stages of the amplifier. This arrangement provides a feedback loop to hold the gain of the amplifier at a practically constant level. Resistors R1404 and R1406 set the bias conditions for Q1401. The amplified signal at the collector of Q1401 is direct-coupled to the base of audio driver-amplifier Q1402.

4-152. Transistor Q1402 functions as the audio driver-amplifier. Resistors R1408 and R1409 comprise a voltage divider which tends to hold the emitter of Q1402 at a constant potential. Collector current is supplied through diode CR1402 and resistors R1411 and R1410 from the +20-volt regulated dc source in the transceiver. 'Bootstrapping' is provided through capacitor C1404 from the output circuitry used in the final stage of the amplifier. This bootstrap network, comprised of capacitor C1404 and resistors R1410 and R1411, is employed to increase the ac load impedance of the driver stage so that a greater signal amplitude can be handled by the stage without clipping. The driver stage is direct-coupled to audio output amplifier Q1403 and Q1404.

4-153. Transistors Q1403 and Q1404 function as a complementary symmetry pair for the audio output stage. The circuit is arranged as a Class B, push-pull, emitter-follower amplifier. Operation of the circuit is such that with an input signal of a given instantaneous polarity, one transistor is biased on while the other is nonconducting. As the polarity of the input signal reverses, the first transistor is reverse biased while the second conducts. Diode CR1402 prevents crossover distortion. Gain of the three-stage amplifier is determined by the ratio of the value of resistor R1413 to that of resistor R1407. This is evident by the fact that the output signal at the junction of resistors R1412 and R1413 is impressed across a voltage divider formed by R1413 and R1407. Since the emitter of transistor Q1401 is connected to the junction of R1413 and R1407, the input of the amplifier samples the output. Resistor R1413 and shunt capacitor C1405 form a network which attenuates high audio frequencies above 6,000 cycles. The audio output signal is coupled through capacitor C1406 and transformer T1401 to pins 28 and 29 of the lower insert on receptacle J1 at rear of transceiver. Transformer T1401 is designed to operate into a nominal output load of 500 ohms. However, proper operation can be achieved when T1401 is terminated in load impedances ranging from 200 ohms to infinity.

4-154. METERING CIRCUITS.

4-155. Metering of important circuits in the transmitter is accomplished by means of 11-position meter switch S1902, the current shunt resistor or multiplier resistor in the circuit to be measured, and meter M1 on the transceiver front panel.

4-156. POWER SUPPLY AND CONTROL CIRCUIT THEORY.

4-147. GENERAL.

4-158. The transceiver power supply and control circuits are, for the most part, common to both receiver and transmitter. A transient suppressor, a voltage regulator, and two dc-to-dc converters are utilized to produce all operating voltages in the transceiver exclusive of the primary dc power. Control functions are accomplished by means of relays, transistor and diode switches, or by a combination of these methods. For complete power supply and control circuit details, refer to the schematic diagram in figure 7-1.

4-159. POWER SUPPLY AND CONTROL CIRCUIT BLOCK DIAGRAM.

4-160. A block diagram of the transceiver power supply and control circuits is shown in figure 4-4. Dashed lines on the block diagram indicate control paths that are completed only during the transmit mode of operation. The +27.5-volt dc primary power for the transceiver may be either 'switched' or 'unswitched', depending on installation requirements. In installations that use 'unswitched' primary power, +27.5 volts dc is applied directly to the transceiver power supply and control circuits.

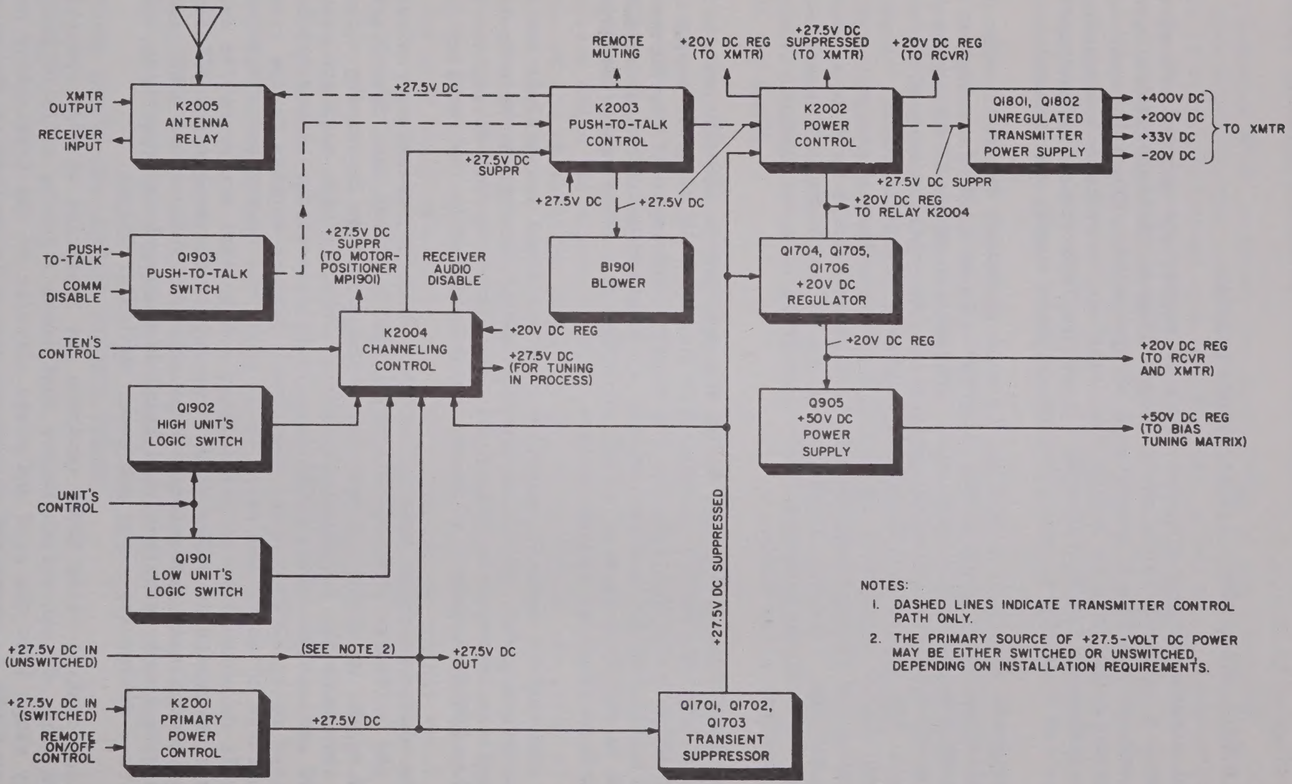
4-161. Primary power control relay K2001 is used to switch the +27.5-volt primary power in installations that employ this function. Relay K2001 is energized by the OFF-PWR switch on the remote control unit. Contacts on relay K2001 supply +27.5 volts dc to the input of the transient suppressor, to contacts on push-to-talk relay K2003, and to the filaments of transmitter power amplifier V1201. Transistors Q1701, Q1702, and Q1703 serve as a transient suppressor that performs the dual function of protecting the transceiver against line transients as well as against reverse-polarity input voltage. The +27.5-volt dc output of the transient suppressor is supplied to the +20-volt dc regulator and to contacts on power control relay K2002 and channeling control relay K2004.

4-162. Transistors Q1704, Q1705, and Q1706 are employed as the +20-volt dc regulator. Output of the regulator is supplied to the +50-volt dc power supply, to various continuously-operated stages in the receiver and transmitter, to contacts on power control relay K2002, and to the coil of channeling control relay K2004. Transistor Q905 is employed as a dc-to-dc converter that furnishes a constant +50-volt dc potential to the bias tuning matrix.

4-163. During the receive mode of operation, power control relay K2002 and antenna relay K2005 are de-energized. Contacts on relay K2002 then apply the output of the +20-volt dc regulator to receiver stages that are operative only during reception. Contacts on relay K2005 connect the communications antenna to the receiver input.

4-164. When the microphone push-to-talk switch is pressed, transistor switch Q1903 is turned 'on' and activates push-to-talk relay K2003, unless the 'Comm Disable' bus is grounded or the motor-positioner channeling mechanism is running. Contacts on relay K2003 then mute the companion communications receiver, activate power control relay K2002 and antenna relay K2005, and start transmitter blower B1901. Contacts of energized relay K2005 connect the communications antenna to the transmitter output. Contacts of energized relay K2002 apply the suppressed +27.5-volt and regulated +20-volt dc potentials to transmitter stages that are operative only during transmission. Contacts of relay K2002 also supply the suppressed +27.5-volt dc potential to the unregulated transmitter power supply. Transistors Q1801 and Q1802 are employed in a dc-to-dc converter that furnishes unregulated operating voltages for the transmitter driver-amplifier and power amplifier stages.

4-165. Channeling control relay K2004 controls the operation of motor-positioner MP1901 which, in turn, drives switch rotors that connect tuning coils of the appropriate frequency range into the grid and plate circuits of the transmitter power amplifier. Relay K2004 is energized whenever a ground is applied to the relay coil by means of information derived from the ten's and/or unit's control wires. A ground initiated by the ten's control information is applied directly to the coil


XMTR OUTPUT
RECEIVER INPUT
K2005 ANTENNA RELAY
+27.5V DC
K2003 PUSH-TO-TALK CONTROL
REMOTE MUTING
+20V DC REG (TO XMTR)
+27.5V DC SUPPRESSED (TO XMTR)
+20V DC REG (TO RCVR)
K2002 POWER CONTROL
Q1801, Q1802 UNREGULATED TRANSMITTER POWER SUPPLY
+400V DC
+200V DC
+33V DC
-20V DC
TO XMTR
+27.5V DC SUPPR
+27.5V DC
+27.5V DC
+27.5V DC SUPPR
+20V DC REG TO RELAY K2004
PUSH-TO-TALK
COMM DISABLE
Q1903 PUSH-TO-TALK SWITCH
+27.5V DC SUPPR (TO MOTOR-POSITIONER MP1901)
RECEIVER AUDIO DISABLE
B1901 BLOWER
Q1704, Q1705, Q1706 +20V DC REGULATOR
TEN'S CONTROL
K2004 CHANNELING CONTROL
+20V DC REG
+27.5V DC (FOR TUNING IN PROCESS)
+20V DC REG
+20V DC REG (TO RCVR AND XMTR)
Q1902 HIGH UNIT'S LOGIC SWITCH
Q905 +50V DC POWER SUPPLY
+50V DC REG (TO BIAS TUNING MATRIX)
UNIT'S CONTROL
+27.5V DC SUPPRESSED
Q1901 LOW UNIT'S LOGIC SWITCH
+27.5V DC IN (UNSWITCHED)
(SEE NOTE 2)
+27.5V DC OUT
+27.5V DC IN (SWITCHED)
REMOTE ON/OFF CONTROL
K2001 PRIMARY POWER CONTROL
+27.5V DC
Q1701, Q1702, Q1703 TRANSIENT SUPPRESSOR

NOTES:

1. DASHED LINES INDICATE TRANSMITTER CONTROL PATH ONLY.
2. THE PRIMARY SOURCE OF +27.5-VOLT DC POWER MAY BE EITHER SWITCHED OR UNSWITCHED, DEPENDING ON INSTALLATION REQUIREMENTS.

Figure 4-4. Power Supply and Control Circuit Block Diagram

of K2004 through contacts on a control switch wafer mounted on the motor-positioner drive shaft. Unit's control information operates one or the other of transistor switches Q1901 or Q1902, depending on the unit's digit selected. When unit's digits 0 through 4 are selected at the remote control unit, low unit's logic switch Q1901 is turned 'on' and supplies a ground to the coil of K2004 through contacts on the control switch wafer. When unit's digits 5 through 9 are selected, high unit's logic switch Q1902 is turned 'on' and supplies the control ground.

4-166. Contacts on energized relay K2004 apply suppressed +27.5 volts dc to motor-positioner MP1901 and to the remote 'tuning-in-process' function. Other contacts on K2004 disable the receiver audio output while the motor-positioner is functioning. Motor-positioner MP1901 continues to operate until the control switch wafer rotor on the drive shaft reaches an open-circuit position and removes the ground from the coil of relay K2004. With the ground removed, relay K2004 is de-energized. The motor-positioner then stops functioning and remains stationary until a different channel frequency is selected.

4-167. POWER SUPPLY CIRCUITS.

4-168. TRANSIENT SUPPRESSOR. A transient suppressor circuit is employed in the transceiver to provide protection against transients on the +27.5-volt dc primary power line. The circuit also provides protection against reverse-polarity primary input voltage. The transient suppressor is comprised basically of transistors Q1701 through Q1703 and diodes CR1702 through CR1705. Operation of the circuit is as follows: When a transient is present on the +27.5-volt line with an amplitude sufficient to exceed the Zener point of diode CR1702, diode CR1702 will conduct causing transistor Q1701 to turn on. As the amplitude of the transient increases, transistor Q1701 is driven into saturation. In this condition, the voltage drop from the emitter to the collector of transistor Q1701 is at a minimum, effectively creating a short circuit from the base of transistor Q1703 to the emitter of transistor Q1702. Under normal operating conditions, transistors Q1702 and Q1703 are saturated. With a short circuit existing across Q1702 and Q1703, the two transistors are driven to cutoff. The transient voltage is then dropped across the two transistors. When a fast-rise-time transient is present on the +27.5-volt line, Zener diode CR1703 conducts. With diode CR1703 in conduction, a portion of the transient voltage is shunt ed around transistor Q1701, thereby protecting transistor Q1701 from damage. The dc output of the transient suppressor is applied to the input of the +20-volt dc regulator, and to contacts on relays K2002 and K2004. When reverse-polarity voltage is applied to the input of the transient suppressor, transistor Q1703 is turned off due to the resultant positive voltage on its base. Transistor Q1702 is also turned off due to the positive voltage coupled through diode CR1705. With transistors Q1702 and Q1703 both turned off, the output of the transient suppressor falls to near zero voltage thus protecting the equipment against the reverse-polarity input source.

4-169. POSITIVE 20-VOLT DC REGULATOR. A +20-volt dc regulator circuit is employed in the transceiver, utilizing transistors Q1704 through Q1706. With primary power applied to the transceiver, the dc output of the transient suppressor is routed to the regulator circuit the operation of which is as follows: The voltage regulator makes use of the controlled resistance of transistor Q1704 to provide regulation. Under low input voltage conditions, transistor Q1704 is biased to heavy conduction. As the input voltage varies from its minimum to its maximum value, the variations above normal are dropped across the emitter-to-collector resistance of transistor Q1704. This is accomplished in the following manner. Transistors Q1705 and Q1706 are employed as bias control amplifiers for series regulator transistor Q1704. A Zener diode (CR1708) and two temperature-compensating diodes (CR1706 and CR1707) form a series network from the emitter of transistor Q1706 to ground. The Zener voltage is used as a reference for setting the output voltage of the regulator circuit by means of control R1714, designated as the REG VOLT (regulated voltage) control. When control R1714 has been properly set, an essentially constant output voltage is provided from the regulator over dc input voltage variations of from +10 to -20%. An increase in input voltage causes a greater difference between the Zener voltage and the regulator output voltage. An increase in the difference between these two voltages increases the collector current of transistor Q1706, which controls the bias current supplied to transistor Q1705. With increased forward bias, the conduction of transistor Q1705 increases, resulting in a decreasing voltage drop from the emitter to the collector of this stage. The emitter-to-collector voltage of transistor Q1705 is used to provide bias voltage for series regulator transistor Q1704. With decreased bias voltage, the resistance of transistor Q1704 increases, and a greater portion of the input voltage is dropped across transistor Q1704. The emitter-to-collector resistance of transistor Q1704 can be thought of as a series resistance, the value of which is a function of the input supply voltage.

4-170. Capacitor C1701 is shunted across the output of the regulator circuit to prevent the regulator from oscillating. REG VOLT control R1714 is set to provide an output of +20 volts dc from the regulator circuit. The output of the regulator is applied to various circuits in both the receiver and the transmitter.

4-171. POSITIVE 50-VOLT POWER SUPPLY. A +50-volt dc power supply is employed in the transceiver to supply voltage for the bias tuning matrix. The power supply is comprised of a low-power dc-to-dc converter utilizing transistor Q905 and saturable transformer T901 in a blocking oscillator arrangement. The voltage from a secondary winding of the saturable transformer is rectified to provide the +50-volt dc output.

4-172. The dc-to-dc converter is supplied operating power from the output of the +20-volt dc regulator circuit in the transceiver. The +20-volt source is connected to the input of the converter through coil L901. Coil L901 and capacitor C901 form a filter which is used to prevent ac voltages developed in the converter from being applied to the +20-volt dc source. When power is initially applied to the converter, a small dc current flows from the +20-volt source through resistor R917, the feedback winding of transformer T901, and the base-to-emitter junction of transistor Q905, to ground. This current causes transistor Q905 to conduct and a larger current to flow through the primary winding of transformer T901 into the collector of Q905. Transformer action between the primary and feedback windings of T901 causes additional base current to flow through the transistor, and Q905 is driven into saturation. Current through the primary winding of the transformer then increases until the transformer core is saturated, thereby causing the rate of flux to drop near zero. At this point, transformer action stops and the base current of transistor Q905 decreases. This causes the current through the primary winding of the transformer to decrease, which causes the flux to collapse. Voltages of opposite polarity to that which previously existed are induced in the transformer feedback winding, and current in the primary winding falls to zero. Capacitor C902 tends to lengthen the current fall-time and to reverse the residual core flux before the next cycle begins.

4-173. Transistor Q905, operating from cutoff to saturation, provides a square wave output. The output frequency is primarily determined by the number of turns in the primary winding of the transformer, the supply voltage, and the saturation flux of the transformer core. The power supply operates on a frequency of approximately 3,000 cps. At cutoff, the voltage across transistor Q905 is high but current flow is essentially zero. During saturation, current flow is high but the voltage across the transistor is low, Therefore, transistor Q905 is operated at a low average power dissipation.

4-174. A single voltage-step-up secondary winding is provided on saturable transformer T901 to drive the rectifier circuitry. The winding supplies approximately 50.5 volts ac to diode CR910 which functions as a half-wave rectifier. Capacitor C903 provides output filtering. The +50-volt dc output of the power supply is fed through resistor R918 and applied to the bias tuning matrix.

4-175. **UNREGULATED TRANSMITTER POWER SUPPLY.** A transistorized dc-to-dc converter is used to furnish operating voltages to driver-amplifier transistor Q1102 and to power amplifier V1201. Saturable transformer T1801, transistors Q1801 and Q1802, diode CR1803, and resistors R1808, R1809, R1810, and R1816 serve as the primary elements of a dc-to-dc inverter to generate square-wave ac voltages from the suppressed +27.5-volt input. Transistors Q1801 and Q1802 are arranged in a grounded-collector configuration. The primary side of transformer T1801 is wound as an autotransformer. Those windings connected between emitter and base of transistors Q1801 and Q1802 serve as feedback windings. The tapped emitter-to-emitter winding is considered to be the primary winding for this discussion.

4-176. Characteristics of the inverter circuitry are essentially the same as those of an astable multivibrator. When the push-to-talk switch on the microphone is pressed, contacts 3 and 4 on power control relay K2002 apply a suppressed +27.5-volt potential to the center tap on the primary of transformer T1801 and to capacitor C1809 through diode CR1803. Capacitor C1809 charges rapidly to the full value of the applied voltage and effectively reduces the converter output impedance to insure initiation of the multivibrator action under all operating conditions. Due to the inherent imbalance in the converter circuitry, one of the transistors starts to conduct. For this discussion, it is assumed that the initial conduction occurs in transistor Q1801. Resistor R1808 establishes the initial forward starting bias for Q1801. As transistor Q1801 starts to conduct, a voltage is developed across the upper half of the transformer primary winding that, in turn, induces a voltage in all other transformer windings. Voltage induced in the upper feedback winding drives Q1801 further into conduction while voltage of opposite polarity in the lower windings of the transformer drives transistor Q1802 into cutoff.

4-177. Current in transistor Q1801 increases rapidly until the collector is driven into the saturation region of its characteristic. When this condition occurs, the primary voltage can no longer increase and a condition of quasi-stable equilibrium is maintained. During this equilibrium period, the voltage drop from emitter to collector of Q1801 is negligible, and essentially the full supply voltage appears across the upper half of the transformer primary. Current through the primary then increases rapidly until the transformer core reaches saturation and the rate of flux change drops to near zero. At this point, the voltage across the primary begins to decrease, accompanied by a corresponding reduction in collector current that causes transistor Q1801 to cut off. The first half cycle is then complete.

4-178. As the magnetic flux collapses, voltage induced into the lower windings of the transformer drives transistor Q1802 into conduction to initiate the second half cycle. Operation of the second half cycle is identical to the first half cycle except that transistor Q1802 conducts until the transformer core is driven into negative saturation. After the core becomes saturated, the magnetic flux again collapses and the full cycle is complete. Transistors Q1801 and Q1802 continue to conduct alternately at the rate of approximately 1,000 cps. All output voltages of the transformer are in the form of square waves. Choke L1801 and capacitors C1802 and C1804 serve as a filter network to prevent alternating currents from entering the dc input power source.

4-179. Two high-voltage dc potentials are derived from the secondary winding of transformer T1801. Ac voltage developed across the secondary winding is rectified by a full-wave bridge rectifier consisting of diodes CR1806 through CR1809. Output of the rectifier is filtered by resistor R1813 and capacitor C1809 and a positive 400-volt potential is developed across a bleeder network consisting of resistors R1814 and R1815. This +400-volt potential is fed through the upper output winding on the secondary of modulation transformer T1601 and applied to the plate circuit of power amplifier V1201. A positive 200-volt potential, one half of the full-wave bridge output, is obtained from the center tap on the secondary of transformer T1801. Capacitor C1808 provides the filtering for this output. The +200-volt potential is fed through the center output winding on the secondary of modulation transformer T1601 and applied to the screen grid circuit of power amplifier V1201.

4-180. Two low-voltage dc potentials are derived from taps on the autotransformer primary of transformer T1801. Ac voltage from one tap on transformer T1801 is applied to the cathode of diode CR1802 through capacitor C1805. Diode CR1802 serves as a half-wave rectifier for the negative half cycles of the ac voltage. Capacitor C1803 provides the filtering for this bias supply. The rectified voltage is applied to the anode of Zener diode CR1801 through current limiting resistor R1803. Diode CR1801 'clamps' the output of the bias supply at approximately a negative 20-volt level. The negative 20-volt potential is fed through grid leak resistor R1802 to the control grid circuit of power amplifier V1201 and through resistor R1817 to the cathode of switching diode CR101. Ac voltage from two taps on transformer T1801 are applied to a full-wave rectifier consisting of diodes CR1804 and CR1805. Output of the rectifier, at a positive potential of approximately 33 volts, is filtered by capacitor C1801. The +33-volt potential is fed through resistor R1805 to the collector circuit of driver-amplifier transistor Q1102 and through resistor R1010 to the ATCSS keying circuit.

4-181. CONTROL CIRCUITS.

4-182. RECEIVE MODE. Primary power relay K2001 provides a means of switching 27.5-volt dc primary power in installations requiring a 'switched' input. In such installations, the +27.5-volt dc primary power source is connected to one side of the coil of relay K2001, via pins 3 and 4 of the upper insert on equipment connector J1. The other side of the relay coil is returned via isolation diode CR1701 and pin 9 of the upper insert on connector J1 to the remote Communications OFF-PWR switch contained on the Wilcox Type 97650-100 control unit. When the Communications OFF-PWR switch on the control unit is placed in the PWR position, relay K2001 is energized, causing contacts 3 and 4 to close. With contacts 3 and 4 closed, +27.5 volts dc is applied to the input of the transient suppressor (transistors Q1701 through Q1703), to the filament circuit of power amplifier tube V1201 through voltage-dropping resistors R1701 and R1702, and to contact number 4 on push-to-talk relay K2003.

4-183. In installations requiring an 'unswitched' primary input circuit, primary power relay K2001 is bypassed, and the +27.5-volt dc primary power source is connected directly to the points described in preceding paragraph 4-182.

4-184. Channeling control relay K2004 is de-energized until a ground is applied to one side of the relay coil by information derived from the ten's/unit's control wires in the transceiver. In the de-energized condition, +27.5-volt dc power from the output of the transient suppressor is supplied to one side of the coil of push-to-talk relay K2003, via contacts 7 and 8 of relay K2004. With relay K2004 de-energized, the motor terminals of motor-positioner MP1901 are shorted through resistor R1904 and contacts 4 and 5 of the relay, thus preventing the motor-positioner from operating. In addition, contacts 4 and 5 connect pin 24 of the upper insert on equipment connector J1 to ground through resistor R1904, thereby disabling the 'tuning-in-process' function. The +27.5-volt dc output of the transient suppressor is applied directly to contact number 4 of power control relay K2002. The operation of the channeling control relay in the transmit mode is discussed in subsequent paragraphs 4-192 through 4-198.

4-185. Transistor Q1903, designated as the push-to-talk switch, is used to control the switching action of push-to-talk relay K2003. One side of coil of relay K2003 is connected to the collector of transistor Q1903. Transistor Q1903 is turned off when the transceiver is in the receive mode, due to the absence of a return circuit for the emitter of the transistor. With transistor Q1903 turned off, the coil of relay K2003 is isolated from ground and the relay is de-energized.

4-186. With the transceiver in the receive mode, power control relay K2002 is de-energized, and the output of the +20-volt dc regulator is applied to the required circuits in the receiver, via contacts 7 and 8 of the relay.

4-187. During receive operation, antenna relay K2005 is de-energized and connects the communications antenna to tracked filter FL101 in the receiver through contacts of the antenna relay and mating connectors P2002/J2002 and J2003/P2003.

4-188. TRANSMIT MODE. The discussion given in preceding paragraphs 4-182 and 4-183, pertaining to the operation of primary power relay K2001 in the receive mode, is directly applicable to the operation of the relay in the transmit mode.

4-189. When the 'push-to-talk' control on the system microphone is depressed, a ground is applied to the emitter circuit of transistor switch Q1903. Transistor Q1903 then turns 'on', unless the 'Comm Disable' bus is grounded or the motor-positioner channeling mechanism is running. With transistor Q1903 turned on, one side of the coil of push-to-talk relay K2003 is connected to ground through a low impedance path formed by diodes CR1909 and CR1910, and the emitter-to-collector resistance of the transistor. Connecting the coil of relay K2003 effectively to ground causes the relay to be activated. When relay K2003 is activated, contacts 6 and 7 close shorting pins 10 and 11 of the upper insert on equipment connector J1 to provide muting for a companion communications receiver. In addition, contacts 3 and 4 close applying +27.5-volts dc to the coils of power control relay K2002, antenna relay K2005, and blower motor B1901, to operate the two relays and start the transmitter blower.

4-190. When power control relay K2002 is energized, the +20-volt regulated dc source in the transceiver is connected to various circuits in the transmitter, via contacts 6 and 7 of the relay. In addition, contacts 3 and 4 of relay K2002 supply +27.5-volt dc power to the unregulated transmitter power supply and to the modulator driver-amplifier and modulator output stages in the transmitter.

4-191. When antenna relay K2005 is energized, the communications antenna is connected to the output of the low-pass filter in the transmitter via mating connectors P2002/J2002, contacts of the antenna relay, and mating connectors J2001/P2001.

4-192. Channeling control relay K2004 is used to control the action of motor-positioner mechanism MP1901 which, when operated, tunes the transmitter power amplifier to a frequency determined by the ten's/unit's digital information from the remote control unit. Note that relay K2004 can be energized in the receive mode as well as in the transmit mode. Under this arrangement, the same channel frequency may be used immediately for transmission without the delay that would otherwise be caused by the rotation of motor-positioner MP1901.

4-193. One side of the coil of channeling control relay K2004 is connected to the output of the +20-volt dc regulator in the transceiver. The other side of the relay coil is returned to contacts provided on the rear side of switch section S1901, located on motor-positioner mechanism MP1901. Relay K2004 is energized whenever a ground is applied to the coil of the relay through contacts of switch section S1901. Application of the ground is controlled by information derived from the ten's/unit's control wires in the transceiver.

4-194. The ten's control wires are connected through isolation diodes (CR1901 through CR1904) to contacts provided on the front of switch section S1901. When the cathodes of two of the isolation diodes are grounded through action of the switching circuits in the remote control unit, these diodes conduct. This causes a ground to be applied to the coil of relay K2004 through the two conducting diodes and contacts on switch section S1901, thus energizing the relay. When relay K2004 is energized, contacts 3 and 4 of the relay close, applying suppressed 27.5 volts dc to the coil of motor-positioner MP1901. The motor-positioner then operates rotating switches S1901, S1101, and S1201. The motor-positioner continues to operate until the rotor on the front of switch section S1901 reaches an open-circuit position which removes the ground from the coil of relay K2004 and stops the mechanism. Switch sections S1101 and S1201 switch rf coils to tune the transmitter power amplifier to the frequency determined by the remote control unit.

4-195. During the time that relay K2004 is energized, contacts 3 and 4 supply suppressed +27.5 volts dc to pin 24 of the upper insert on equipment connector J1 to provide the 'tuning-in-process' function. In addition, the +27.5-volt dc source is disconnected from the coil of push-to-talk relay K2003 due to the switching action of contacts 7 and 8, thereby preventing the transmitter from being keyed during the channeling process. Contacts 6 and 7 of relay K2004 serve to disable the receiver audio during the channeling time by applying a ground through resistor R1904 to the cathode of diode CR305. Diode CR305 then conducts and switches off transistors Q304 and Q306 in the receiver audio amplifier, thereby disabling the audio output of the receiver.

4-196. Unit control wires A, B, and C are used to supply unit digital information to control transistor switches Q1901 and Q1902. Transistor Q1901 is switched on to provide a ground for the coil of channeling control relay K2004 whenever unit digits 0 through 4 are selected at the remote control unit. Transistor Q1902 is switched on to provide the ground for relay K2004 whenever unit digits 5 through 9 are selected. Operation of the switching circuit is as follows: When unit digits 0, 1, 3, or 4 are selected at the remote control unit, a ground is applied to unit control wire B. This effectively grounds the base of transistor Q1902 through diode CR938, turning on low unit's logic switch Q1901. Transistor Q1901 then supplies a ground to the coil of relay K2004 through a contact position on the rear of switch section S1901, energizing relay K2004 and starting motor-positioner MP1901. The motor-positioner continues to operate until the rotor on the rear of switch section S1901 reaches an open-circuit position which removes the ground from relay K2004 to stop the mechanism.

4-197. When unit digit 2 is selected at the remote control unit, a ground is applied to unit control wires A and C. This effectively grounds the base of transistor Q1902, due to conduction through resistors R931 and R930 and isolation diodes CR952 and CR948. This condition again causes low unit's logic switch Q1901 to turn on, grounding the coil of relay K2004 and starting the motor-positioner as described in preceding paragraph 4-196.

4-198. When unit digits 5 through 9 are selected at the remote control unit, no ground appears on unit control wire B. In addition, ground is removed either from unit control wire A or unit control wire C, or from both of these control wires. This causes the positive voltage appearing on the base of high unit's logic switch Q1902 to increase to a point where Q1902 turns on. Transistor Q1902 then supplies a ground to the coil of relay K2004 through a contact position on the rear of switch section S1901, energizing relay K2004 and starting motor-positioner MP1901. The motor-positioner continues to operate until the rotor on the rear of switch section S1901 reaches a new open-circuit position which removes the ground from relay K2004 to stop the mechanism.

4-199. When a ground is applied to the 'Comm Disable' bus through the systems wiring via pin 13 of the upper insert on equipment connector J1, the cathode of diode CR306 is grounded. This causes transistors Q304 and Q306 in the receiver audio amplifier to switch off, thereby disabling the receiver audio. Grounding the 'Comm Disable' bus causes diode CR1911 in the base circuit of transistor Q1903 to become forward-biased, thereby grounding the base of transistor Q1903 and disabling the transistor. This prevents the transmitter from being keyed until the ground is removed from the 'Comm Disable' bus.

SECTION V

PREVENTIVE AND CORRECTIVE MAINTENANCE

5-1. GENERAL.

5-2. This section contains maintenance procedures required to maintain the transceiver in proper operating condition. These procedures give detailed instructions for inspection, operational checks, cleaning, test, alignment, adjustment, and trouble shooting. The procedures should be performed by personnel who have a complete knowledge and understanding of the theory of operation described in Section IV of this manual.

5-3. PREVENTIVE MAINTENANCE.

5-4. Preventive maintenance procedures given in subsequent paragraphs are a systematic series of periodic mechanical and electrical checks which serve to minimize transceiver malfunctions and the resultant interruptions in service. Time periods at which the procedures should be performed are not specified and should be established by the responsible authority.

5-5. VISUAL INSPECTION. Check transceiver installation in the aircraft as follows:

a. Alternately apply and remove pressure at top of transceiver to check resiliency of equipment rack shockmounts. Make sure that rack and associated ground straps are securely fastened.

b. Check all components for evidence of breakage, vibration, overheating, corrosion, etc.

c. Examine interconnect wiring and cabling for kinks, fraying, breaks, deterioration, etc.

d. Inspect all cable connections, making sure that plugs and receptacles are free from corrosion and are correctly secured.

e. Check mechanical operation of remote control unit switches and controls.

5-6. OPERATIONAL CHECK. Check operation of transceiver in aircraft as follows:

a. Close NAV/COMM aircraft circuit breaker and set remote control unit COMM OFF/PWR switch to PWR position.

b. Check operation of receiver by depressing remote control unit COMM TEST switch to disable receiver squelch circuit. Receiver background noise should be heard in headset.

c. Refer to figure 5-1, set front panel meter switch S1902 to PWR OUT position, and operate microphone push-to-talk (PTT) switch. Check front panel meter M1 for a minimum indication of 25 watts and release microphone ptt switch. Record meter reading to serve as a useful comparison in future checks and maintenance procedures.

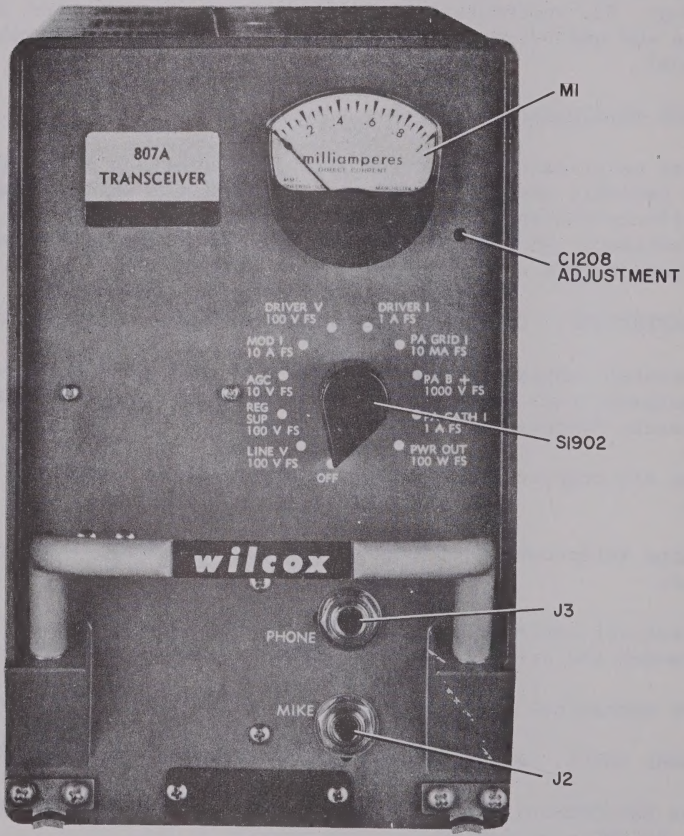

MI
807A TRANSCEIVER
milliamperes
DIRECT CURRENT
C1208 ADJUSTMENT
DRIVER V 100 V FS
DRIVER I 1 A FS
MOD I 10 A FS
PA GRID I 10 MA FS
AGC 10 V FS
PA B + 1000 V FS
REG SUP 100 V FS
PA CATH I 1 A FS
LINE V 100 V FS
PWR OUT 100 W FS
OFF
S1902
wilcox
PHONE
J3
MIKE
J2

Figure 5-1. VHF Transceiver Series 807, Front Panel

d. Operate microphone ptt switch, contact another aircraft or the airfield control tower, and check to see that:

(1) Transmitted message is audible in headset.

(2) Control unit VOL control varies volume of the received message in headset.

e. Use control unit COMM frequency selectors to tune transceiver and check transceiver operation on at least two other channels by operating microphone ptt switch and contacting another aircraft or the control tower.

f. Set control unit COMM OFF/PWR switch to OFF position and open aircraft NAV/COMM circuit breaker.

5-7. PREVENTIVE MAINTENANCE TECHNIQUES. The following steps are to be performed with transceiver removed from aircraft and placed on test bench. If an abnormal condition is observed during performance of these steps, make necessary repairs to correct the condition prior to concluding preventive maintenance procedures.

a. Use a clean, dry, lint-free cloth and/or brush and clean interior and exterior of the unit. If necessary moisten cloth or brush with dry cleaning solvent. Dry compressed air may be used at a line pressure not exceeding 60 psi to remove dust from inaccessible places. Care should be taken to prevent mechanical damage by air blast.

b. Clean electrical contacts with a cloth moistened with trichlorethylene; then wipe dry with a dry cloth.

c. Inspect receptacles and plugs for loose connections, loose contacts, dirt, cracks, and corrosion.

d. Examine wires and cables for cracked or damaged insulation.

e. Check mountings, machine screws, and nuts for mechanical looseness.

f. Examine fixed capacitors for leaks, bulges, and dirty, corroded, or loose terminals.

g. Inspect finish for scratches and bare spots. (Retouch, if necessary.)

h. Check soldered terminals for poor solder joints.

5-8. CORRECTIVE MAINTENANCE.

5-9. Corrective maintenance procedures given in subsequent paragraphs include information necessary to test, align, adjust, and trouble shoot the transceiver. Figure 5-14 shows the layout of component parts on printed circuit boards used in the transceiver.

5-10. TEST EQUIPMENT REQUIRED.

5-11. The test equipment listed in Table 5-1, or equivalent, is required to perform the maintenance procedures described in subsequent paragraphs. All references to test equipment in the maintenance procedures will be made by the assigned common names of Table 5-1.

TABLE 5-1. TEST EQUIPMENT REQUIRED

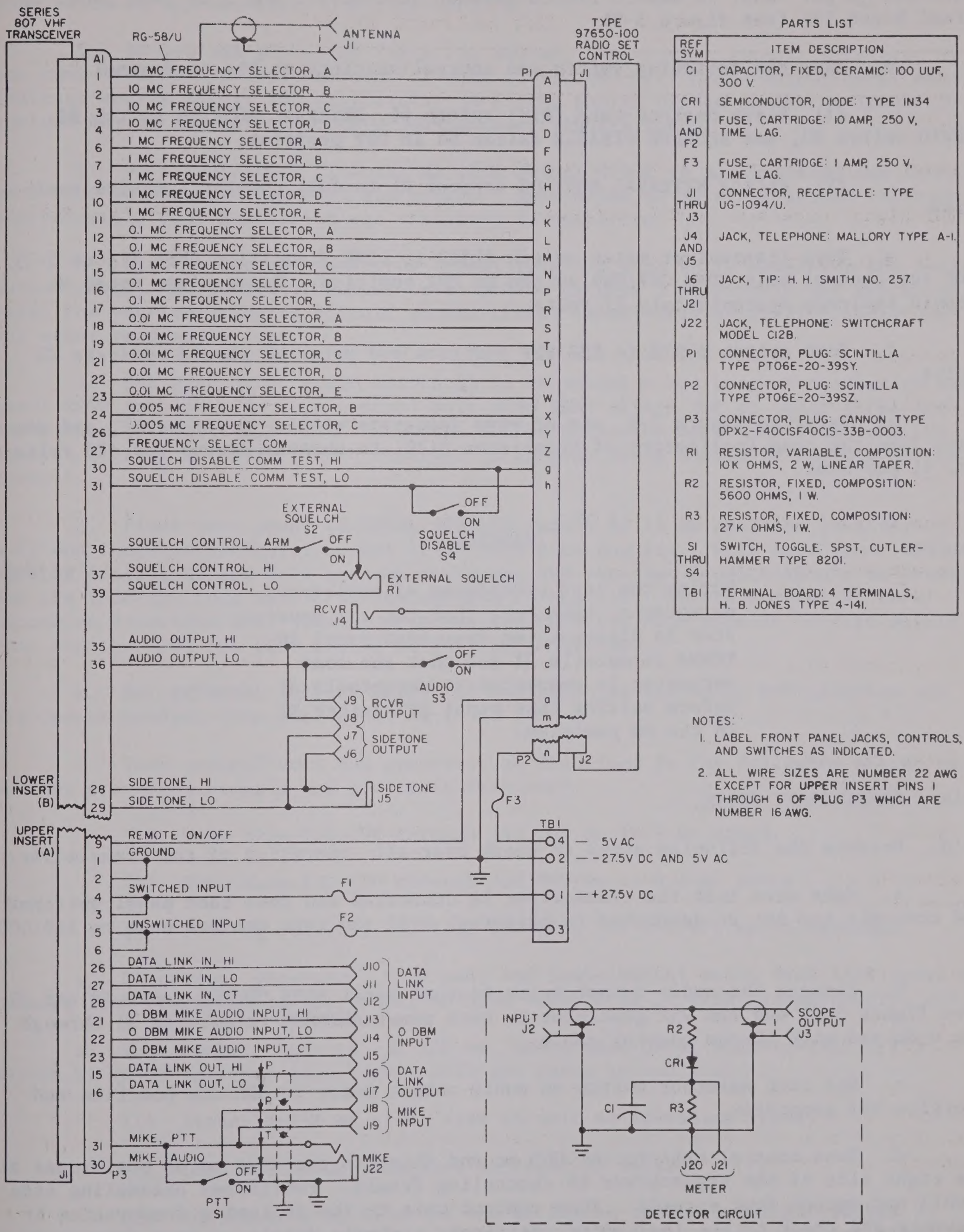
TEST EQUIPMENT	COMMON NAME	MODEL OR TYPE	MANUFACTURER
Test Panel	Test Panel	See figure 5-2	
Power Output Meter	Audio Output Meter	OP-961	Daven
VHF Signal Generator	VHF Generator	608C	Hewlett-Packard
6 db Attenuator	6 db Pad	505A	Boonton
Audio Oscillator	Audio Oscillator	200C	Hewlett-Packard
Termaline Wattmeter	Load Wattmeter	611A	Bird
Oscilloscope	Oscilloscope	545 with Type 53/54B Plug-In Unit and 10:1 Attenuator Probe P6000.	Tektronix
Vacuum Tube Voltmeter	Audio VTVM	400C	Hewlett-Packard
Vacuum Tube Voltmeter (accurate within ±1 per cent)	DC VTVM	412A	Hewlett-Packard
Electronic Counter	Frequency Counter	524D with 525A and 525B Converter Units	Hewlett-Packard
Sweep Frequency Generator	Sweep Generator	900	Jerrold
Headset	Headset	500-ohms	
Microphone	Microphone	100-ohms	

5-12. PREPARATION FOR MAINTENANCE PROCEDURES.

5-13. Complete following steps to prepare the transceiver for test, alignment, adjustment, and/or trouble shooting procedures:

a. Release quarter-turn fasteners on each of the two protective side covers and remove covers from transceiver. Examine unit to determine that all components and chassis assemblies are rigidly connected and that all plug-in transistors and crystals are properly seated in their sockets.

b. Connect test panel cable connectors to the transceiver and the Type 97650-100 Radio Set Control (control unit) as shown in figure 5-2.


SERIES 807 VHF TRANSCEIVER
RG-58/U
ANTENNA J1
TYPE 97650-100 RADIO SET CONTROL
A1
1 10 MC FREQUENCY SELECTOR, A — A
2 10 MC FREQUENCY SELECTOR, B — B
3 10 MC FREQUENCY SELECTOR, C — C
4 10 MC FREQUENCY SELECTOR, D — D
6 1 MC FREQUENCY SELECTOR, A — F
7 1 MC FREQUENCY SELECTOR, B — G
9 1 MC FREQUENCY SELECTOR, C — H
10 1 MC FREQUENCY SELECTOR, D — J
11 1 MC FREQUENCY SELECTOR, E — K
12 0.1 MC FREQUENCY SELECTOR, A — L
13 0.1 MC FREQUENCY SELECTOR, B — M
15 0.1 MC FREQUENCY SELECTOR, C — N
16 0.1 MC FREQUENCY SELECTOR, D — P
17 0.1 MC FREQUENCY SELECTOR, E — R
18 0.01 MC FREQUENCY SELECTOR, A — S
19 0.01 MC FREQUENCY SELECTOR, B — T
21 0.01 MC FREQUENCY SELECTOR, C — U
22 0.01 MC FREQUENCY SELECTOR, D — V
23 0.01 MC FREQUENCY SELECTOR, E — W
24 0.005 MC FREQUENCY SELECTOR, B — X
26 0.005 MC FREQUENCY SELECTOR, C — Y
27 FREQUENCY SELECT COM — Z
30 SQUELCH DISABLE COMM TEST, HI — g
31 SQUELCH DISABLE COMM TEST, LO — h
P1
J1
OFF ON SQUELCH DISABLE S4
EXTERNAL SQUELCH S2
38 SQUELCH CONTROL, ARM
OFF ON
37 SQUELCH CONTROL, HI
39 SQUELCH CONTROL, LO
EXTERNAL SQUELCH R1
RCVR J4
d
b
35 AUDIO OUTPUT, HI — e
36 AUDIO OUTPUT, LO — c
OFF ON AUDIO S3
a
m
J9 J8 RCVR OUTPUT
J7 J6 SIDETONE OUTPUT
LOWER INSERT (B)
28 SIDETONE, HI
29 SIDETONE, LO
SIDETONE J5
P2 n J2
F3
UPPER INSERT (A)
9 REMOTE ON/OFF
1 GROUND
2
4 SWITCHED INPUT
3
5 UNSWITCHED INPUT
6
F1
F2
TB1
4 — 5V AC
2 — -27.5V DC AND 5V AC
1 — +27.5V DC
3
26 DATA LINK IN, HI
27 DATA LINK IN, LO
28 DATA LINK IN, CT
J10 J11 J12 DATA LINK INPUT
21 0 DBM MIKE AUDIO INPUT, HI
22 0 DBM MIKE AUDIO INPUT, LO
23 0 DBM MIKE AUDIO INPUT, CT
J13 J14 J15 0 DBM INPUT
15 DATA LINK OUT, HI
16 DATA LINK OUT, LO
J16 J17 DATA LINK OUTPUT
J18 J19 MIKE INPUT
P P T
31 MIKE, PTT
30 MIKE, AUDIO
MIKE J22
OFF ON PTT S1
J1
P3
INPUT J2
SCOPE OUTPUT J3
R2
CR1
C1
R3
J20 J21 METER
DETECTOR CIRCUIT

PARTS LIST

REF SYM	ITEM DESCRIPTION
C1	CAPACITOR, FIXED, CERAMIC: 100 UUF, 300 V.
CR1	SEMICONDUCTOR, DIODE: TYPE 1N34
F1 AND F2	FUSE, CARTRIDGE: 10 AMP, 250 V, TIME LAG.
F3	FUSE, CARTRIDGE: 1 AMP, 250 V, TIME LAG.
J1 THRU J3	CONNECTOR, RECEPTACLE: TYPE UG-1094/U.
J4 AND J5	JACK, TELEPHONE: MALLORY TYPE A-1.
J6 THRU J21	JACK, TIP: H. H. SMITH NO. 257.
J22	JACK, TELEPHONE: SWITCHCRAFT MODEL C12B.
P1	CONNECTOR, PLUG: SCINTILLA TYPE PT06E-20-39SY.
P2	CONNECTOR, PLUG: SCINTILLA TYPE PT06E-20-39SZ.
P3	CONNECTOR, PLUG: CANNON TYPE DPX2-F40C1SF40C1S-33B-0003.
R1	RESISTOR, VARIABLE, COMPOSITION: 10K OHMS, 2 W, LINEAR TAPER.
R2	RESISTOR, FIXED, COMPOSITION: 5600 OHMS, 1 W.
R3	RESISTOR, FIXED, COMPOSITION: 27 K OHMS, 1 W.
S1 THRU S4	SWITCH, TOGGLE: SPST, CUTLER-HAMMER TYPE 8201.
TB1	TERMINAL BOARD: 4 TERMINALS, H. B. JONES TYPE 4-141.

NOTES:

1. LABEL FRONT PANEL JACKS, CONTROLS, AND SWITCHES AS INDICATED.
2. ALL WIRE SIZES ARE NUMBER 22 AWG EXCEPT FOR UPPER INSERT PINS 1 THROUGH 6 OF PLUG P3 WHICH ARE NUMBER 16 AWG.

Figure 5-2. VHF Transceiver Series 807, Test Panel

c. Set control unit COMM OFF/PWR switch to OFF and apply an external 27.5-volt dc, ±5 per cent, 10-ampere source between terminals 1 and 2 of test panel terminal board TB1 (see figure 5-2).

d. Make the following switch and control settings on the test panel.

(1) Place push-to-talk (PTT) switch S1, EXTERNAL SQUELCH switch S2, AUDIO switch S3, and SQUELCH DISABLE switch S4 in OFF position.

(2) Rotate EXTERNAL SQUELCH control R1 to full counterclockwise position.

e. Turn transceiver meter switch S1902 to LINE V position (see figure 5-1) and set control unit COMM OFF/PWR switch to PWR position. Transceiver meter M1 should indicate approximately 27 volts.

f. Turn switch S1902 to REG SUP position and meter M1 should indicate 20 volts.

g. Refer to figure 2-6, use dc vtvm (accurate within ±1 per cent), and measure from the case (collector) of transistor Q1701 to chassis ground for +20 volts dc, ±1 per cent.

CAUTION

> During the test procedures of subsequent paragraphs, make sure that the vhf generator is disconnected from test panel ANTENNA receptacle J1 and that the load wattmeter is connected to receptacle J1 before setting test panel PTT switch S1 to the ON position.

5-14. PRELIMINARY TESTS.

5-15. Perform the following steps to check over-all operation of the transceiver:

a. Make sure that the transceiver is connected and that test panel switches and controls are set as described in paragraph 5-13 and tune control unit to 149.000 mc.

b. Connect the audio output meter to test panel RCVR OUTPUT jacks J8 and J9 (see figure 5-2) and the vhf generator to test panel ANTENNA receptacle J1 through the 6-db pad with 50-ohm coaxial cable.

c. Set load selector switch on audio output meter to 500-ohm position and energize vhf generator.

d. Tune control unit to 141.000 mc and check to see that motor positioner at the right side of the transceiver is channeling freely. Positioner channeling time should not exceed four seconds. Tune control unit to the following frequencies in sequence and check to see that motor positioner channels freely at each frequency: 116.000, 121.000, 126.000, 131.000, 136.000, and 149.000 mc.

e. Turn meter switch S1902 to AGC position (see figure 5-1) and check for an indication of approximately 0.05, on meter M1.

f. Adjust vhf generator for a 132.500-mc, 6-microvolt signal, modulated 90 per cent at 1000 cps and tune control unit to 132.500 mc. Audio output meter should indicate approximately 100 milliwatts. A slight tuning of the generator frequency control may be required to obtain 100-milliwatt indication.

g. Note indication of meter M1 with switch S1902 in AGC position and increase generator output level to 3000 microvolts. Indication of meter M1 should increase approximately 0.5, indicating agc circuitry is operative.

h. Slowly decrease generator output level to zero while observing the audio output meter. As generator output level passes through 3 microvolts and approaches zero, the receiver squelch circuit should close, immediately decreasing audio output meter reading to zero.

i. Set test panel AUDIO switch S3 to ON position and connect headset to test panel RCVR jack J4. Depress control unit COMM TEST switch for at least three seconds; then release the switch. When the switch is in the depressed position, the squelch circuit is disabled and receiver background noise should be audible in the headset.

j. Place test panel EXTERNAL SQUELCH switch S2 in ON position (see figure 5-2) and increase generator output level to 6.0 microvolts. With test panel EXTERNAL SQUELCH control R1 set full counterclockwise, the receiver squelch should be closed and the 1000-cps tone should not be audible in headset. Rotate control R1 in a clockwise direction and, at some point of the rotation, the squelch circuit should open and the 1000-cps tone should be audible in headset.

k. Set EXTERNAL SQUELCH switch S2 and AUDIO switch S3 to OFF position and disconnect headset from test panel jack J4.

l. Tune control unit and generator as described in the following steps, repeating preceding steps f and h at each frequency.

(1) Tune from 116.000 through 149.000 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

(3) Tune to 132.125, 132.150, 132.175, and 149.975 mc in sequence.

m. Disconnect generator, 6-db pad, and audio output meter from test panel and connect load wattmeter to test panel ANTENNA receptacle J1 with 50-ohm coaxial cable.

n. Tune control unit to 132.500 mc, place test panel push-to-talk (PTT) switch S1 in ON position (see figure 5-2) and check to see that:

(1) Blower motor at right side of unit is operating freely.

(2) Load wattmeter indicates at least 25 watts.

(3) Indications on meter M1 are as listed in Table 5-2 for DRIVER V, DRIVER I, PA GRID, PA B+, PA CATH I, and PWR OUT positions of meter switch S1902. Meter indication obtained for PWR OUT switch position should be approximately the same as indication on load wattmeter.

o. Set test panel PTT switch S1 to OFF position and connect microphone to test panel MIKE jack J22 and headset to SIDETONE jack J5.

p. Set switch S1902 to MOD I position, operate microphone push-to-talk (ptt) switch, and speak into microphone in a normal voice. Indication on meter M1 should vary with modulation, peaking near value listed in Table 5-2, and voice signals should be audible in headset. Release microphone ptt switch.

q. Place test panel PTT switch S1 in ON position, tune control unit as described in the following steps, and note power output at each frequency on load wattmeter. Minimum power output for any frequency should not be less than 25 watts.

(1) Tune from 116.500 through 149.500 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

(3) Tune to 132.125, 132.150, 132.175, 149.975, and 116.000 mc in sequence.

r. Set PTT switch S1 to OFF position and disconnect load wattmeter, headset, and microphone from test panel.

5-16. RECEIVER PERFORMANCE TEST.

5-17. Complete paragraphs 5-18 through 5-25, in sequence, to determine if receiver characteristics meet minimum performance requirements. The minimum performance requirement of a particular receiver characteristic can be checked by performing paragraph 5-18, the paragraph pertaining to the characteristic under test, and paragraph 5-25.

5-18. PREPARATION FOR TEST. Make sure that the transceiver is connected and that test panel switches and controls are set as described in paragraph 5-13 and proceed as follows:

a. Connect audio output meter to test panel RCVR OUTPUT jacks J8 and J9 (see figure 5-2) and vhf generator to test panel ANTENNA receptacle J1 through the 6-db pad with 50-ohm coaxial cable.

b. Place load selector switch on audio output meter in 500-ohm position and energize generator.

c. Release quarter-turn fasteners at the top and front of the receiver chassis and swing chassis outward on attached hinges (see figure 5-3).

4-19. SENSITIVITY.

a. Adjust vhf generator for a 132.500-mc, 3-microvolt signal, modulated 30 per cent at 1000 cps.

b. Place test panel SQUELCH DISABLE switch S4 in ON position and tune control unit to 132.500 mc.

c. Refer to figure 5-3 and adjust AUDIO LEVEL control R308 for an indication of 100 milliwatts on the audio output meter.

TABLE 5-2. TYPICAL METER INDICATIONS

POSITION SWITCH S1902	TYPICAL INDICATION METER M1
OFF	Open circuit.
LINE V	27 volts, approximate.
REG SUP	20 volts.
AGC	0.05, approximate (no signal).
MOD I	**3.5 amperes, maximum.
DRIVER V	*33 volts, ±15 per cent.
DRIVER I	*Depends on frequency of operation; 0.060 amperes minimum; 0.500 amperes maximum; 0.150 amperes typical.
PA GRID I	*Depends on frequency of operation; zero ampere minimum; 0.008 ampere typical.
PA B+	*400 volts, ±15 per cent.
PA CATH I	*Depends on frequency of operation; 300 milliamperes maximum; 200 milliamperes typical.
PWR OUT	*25 watts minimum (unmodulated).

* Test panel PTT switch S1 set to ON.

** Depress microphone push-to-talk switch and speak into mike in normal voice.

d. Turn generator MOD SELECTOR switch to EXT MOD position to remove 1000-cps modulation, record reading on the audio output meter and return MOD SELECTOR switch to INT MOD position. The ratio of the recorded reading to the 100-milliwatt indication of preceding step c is the signal plus noise-to-noise ratio and should be 6 db or better.

e. Tune control unit and generator as described in the following steps, repeating preceding steps a through d at each frequency.

(1) Tune from 116.000 through 149.000 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

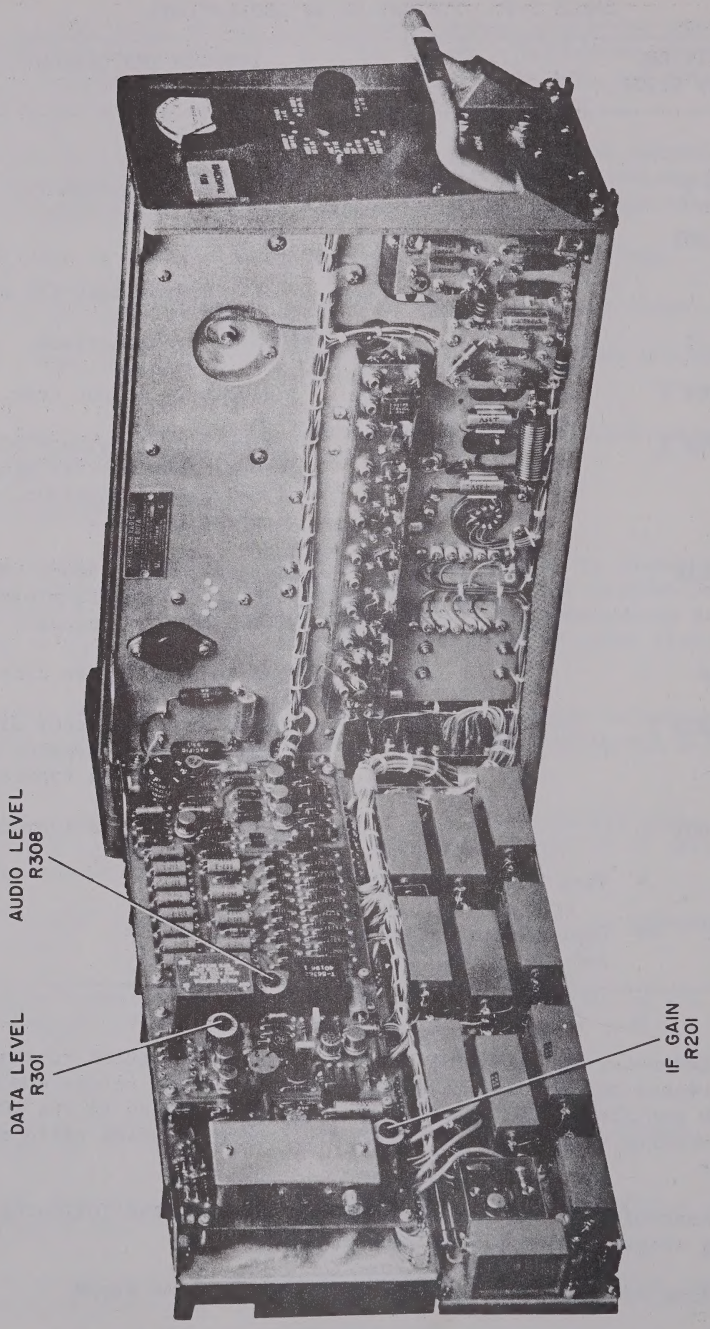

AUDIO LEVEL
R308
DATA LEVEL
R301
IF GAIN
R201

Figure 5-3. VHF Transceiver Series 807, Adjustment Locations

(3) Tune to 132.125, 132.150, 132.175, and 149.175 mc in sequence.

f. Tune control unit and generator to 132.500 mc, increase generator modulation to 90 per cent and adjust AUDIO LEVEL control R308 for 100-milliwatt indication on the audio output meter.

g. Place SQUELCH DISABLE switch S4 in OFF position.

5-20. SELECTIVITY.

a. Connect frequency counter (525B converter) to measure output frequency of vhf generator and tune generator to 132.500 mc as indicated on counter.

b. Adjust generator for 30 per cent modulation at 1000 cps and set output level to zero.

c. Tune control unit to 132.500 mc and place test panel SQUELCH DISABLE switch S4 in ON position (see figure 5-2).

d. Slowly increase generator output level until receiver agc action is initiated. This action is indicated on the audio output meter when the meter indication ceases to increase with the increase in generator output level.

e. Then decrease generator output level to a point just below the level at which the output meter indication starts to decrease. This point is just below the knee of the receiver agc characteristic. Record generator output level setting and indication on the audio output meter.

f. Increase generator output level to double the generator level setting recorded in preceding step e. This is equivalent to a +6-db increase in signal level.

g. Decrease generator output frequency until the recorded indication of preceding step e is obtained on the audio output meter. Record generator output frequency as indicated on the frequency counter.

h. Increase generator output frequency until the recorded indication of preceding step e is obtained on the audio output meter. Record generator output frequency as indicated on the frequency counter.

i. The difference between the recorded frequencies of preceding steps g and h is the 6-db bandwidth and should be at least 30-kc wide (centered ±15 kc from the 132.500-mc reference frequency).

j. Repeat preceding steps f through h except change generator output level of step f to 1000 times the level setting recorded in preceding step e. Then the difference between the recorded frequencies of steps g and h is the 60-db bandwidth and should be less than 63 kc wide (centered within ±31.5 kc of the 132.500-mc reference frequency).

k. Set test panel SQUELCH DISABLE switch S4 to OFF position and disconnect frequency counter from the generator.

5-21. AGC.

a. Adjust vhf generator for a 132.500-mc, 5-microvolt signal, modulated 30 per cent at 1000 cps and tune control unit to 132.500 mc.

b. Refer to figure 5-3 and adjust AUDIO LEVEL control R308 to obtain 100-milliwatt indication on the audio output meter.

c. Vary generator output level from 5 to 100,000 microvolts and note reading at which maximum and minimum audio output is indicated on the audio output meter. Audio output should not vary by more than 3 db over the 5- to 100,000-microvolt range.

d. Repeat preceding step c except vary generator level from 5 to 500,000 microvolts. Audio output should not vary more than 6 db over the 5- to 500,000-microvolt range.

e. Decrease generator output level to 3 microvolts and increase modulation to 90 per cent. Adjust AUDIO LEVEL control R308 for 100-milliwatt indication on the audio output meter.

5-22. SQUELCH.

a. Adjust vhf generator for a 132.500-mc signal, modulated 30 per cent at 1000 cps and set output level to zero.

b. Tune control unit to 132.500 mc and check opening of receiver squelch by increasing generator output level until an indication is just observed on the audio output meter. Generator level should not be greater than 3 microvolts.

c. Slowly decrease generator output level to zero while observing the audio output meter. As the generator output level passes through 3 microvolts and approaches zero, the receiver squelch should close, immediately decreasing audio output meter indication to zero.

d. Tune control unit and generator as described in the following steps, repeating preceding steps a through c at each frequency.

(1) Tune from 116.000 through 149.000 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

(3) Tune to 132.125, 132.150, 132.175, and 149.175 mc in sequence.

5-23. DATA LEVEL OUTPUT.

a. Refer to figure 5-2 and connect audio vtvm across DATA LINK OUTPUT jacks J16 and J17.

b. Adjust vhf generator for a 132.500-mc, 100-microvolt signal, modulated 30 per cent at 1000 cps and tune control unit to 132.500 mc.

c. Refer to figure 5-3 and adjust DATA LEVEL control R301 for a 0.50-volt indication on the audio vtvm. Data level output should be 0.50 volts or greater.

d. Readjust control R301 for normal operation as indicated by a 0.25-volt indication on the audio vtvm.

e. Disconnect audio vtvm from jacks J16 and J17.

5-24. AUDIO RESPONSE.

a. Connect audio oscillator to EXT MOD receptacle on the vhf generator and set MOD SELECTOR switch to EXT MOD position.

b. Energize audio oscillator and set control unit to 132.500 mc.

c. Adjust audio oscillator and generator for a 132.500-mc, 50-microvolt signal, modulated 30 per cent at 1000 cps and tune control unit to 132.500 mc.

d. Refer to figure 5-3 and adjust AUDIO LEVEL control R308 for 100-milliwatt indication on the audio output meter.

e. Vary audio oscillator frequency from 300 to 3750 cps and note readings at which maximum and minimum audio output is indicated on the audio output meter. Audio output should not vary by more than 6 db over the 300- to 3750-cps range.

f. Decrease generator level to 3 microvolts and increase modulation to 90 per cent. Adjust AUDIO LEVEL control R308 for 100-milliwatt indication on the audio output meter.

5-25. FINAL PROCEDURE.

a. Disconnect all test equipment from the test panel.

b. Close the receiver chassis and tighten quarter-turn fasteners.

5-26. TRANSMITTER PERFORMANCE TEST.

5-27. Complete paragraphs 5-28 through 5-34, in sequence, to determine if transmitter characteristics meet minimum performance requirements. The minimum performance requirements of a particular transmitter characteristic can be checked by performing paragraph 5-28, the paragraph pertaining to the characteristic under test, and paragraph 5-34.

5-28. PREPARATION FOR TEST.

a. Make sure that the transceiver is connected and that test panel switches and controls are set as described in paragraph 5-13.

b. Use a 'T' connector on the load wattmeter input jack and connect the load wattmeter to test panel ANTENNA receptacle J1 with 50-ohm coaxial cable. (See figure 5-2.)

5-29. POWER OUTPUT.

a. Place test panel push-to-talk (PTT) switch S1 in ON position.

b. Tune control unit as described in the following steps, noting power output at each frequency on the load wattmeter. Minimum power output for any frequency should not be less than 25 watts.

(1) Tune from 116.500 through 149.500 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

(3) Tune to 132.125, 132.150, 132.175, 149.175, and 116.000 mc in sequence.

c. Set test panel PTT switch S1 to OFF position.

5-30. FREQUENCY ACCURACY.

a. Connect the frequency counter (525B converter) to the 'T' connector on the load wattmeter through a 500-ohm, 2-watt resistor.

b. Place test panel PTT switch S1 in ON position.

c. Tune control unit as described in the following steps, noting frequency counter indication at each frequency. Maximum deviation for any frequency should not be greater than ±0.005 per cent.

(1) Tune from 116.500 through 149.500 mc in 1-mc steps.

(2) Tune from 132.100 through 132.900 mc in 0.1-mc steps.

(3) Tune to 132.125, 132.150, 132.175, 149.175, and 116.000 in sequence.

d. Set PTT switch S1 to OFF position and disconnect frequency counter from load wattmeter.

5-31. MODULATOR GAIN.

a. Connect test panel detector INPUT receptacle J2 to 'T' connector on load wattmeter (see figure 5-2) and the vertical plates of the oscilloscope to detector SCOPE OUTPUT receptacle J3 through a 2-watt attenuator whose ohmic value is determined by oscilloscope sensitivity.

b. Connect the audio oscillator and audio vtvm across test panel MIKE INPUT jacks J18 and J19; energize oscillator and oscilloscope.

c. Release fasteners on the 'hinged' circuit boards on the right side of the center chassis as shown in figure 5-4 and set MOD LEVEL control R1512 to full counterclockwise position.

d. Adjust audio oscillator for a 1000-cps signal and an output level indication of 0.25 volts on the audio vtvm. Tune control unit to 132.500 mc.

e. Set test panel PTT switch S1 to ON position, refer to figure 5-4, and adjust MIC LEVEL control R1509 for a 100 per cent modulation pattern on the oscilloscope. The 100 per cent modulation pattern should be obtained on the oscilloscope.

f. Compute per cent of modulation as shown in figure 5-5 and adjust control R1512 for a 90 per cent modulation pattern on the oscilloscope.

g. Place PTT switch S1 in OFF position.

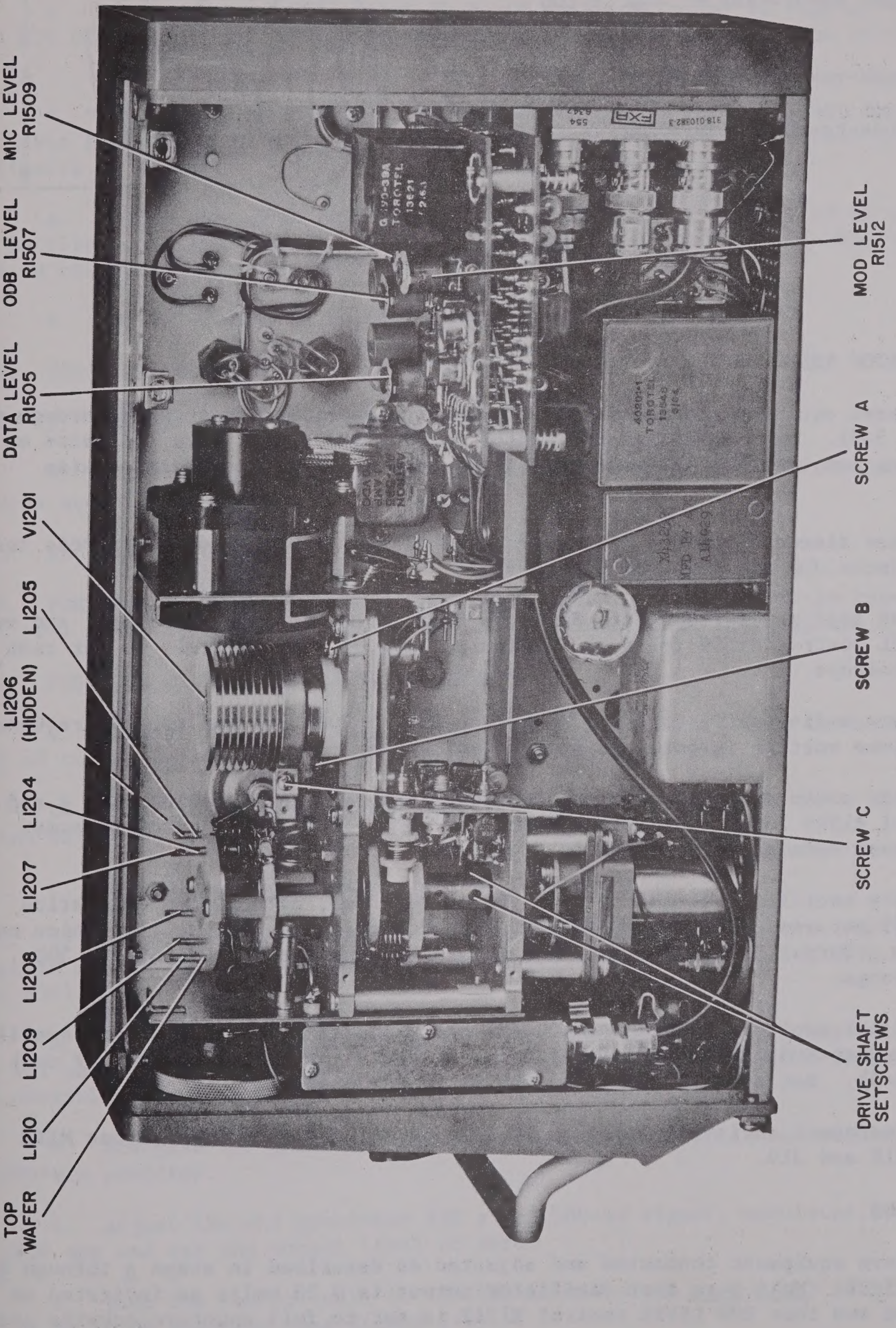

TOP WAFER
L1210
L1209
L1208
L1207
L1204
L1206 (HIDDEN)
L1205
V1201
DATA LEVEL R1505
ODB LEVEL R1507
MIC LEVEL R1509
DRIVE SHAFT SETSCREWS
SCREW C
SCREW B
SCREW A
MOD LEVEL R1512

Figure 5-4. VHF Transceiver Series 807, Adjustment Locations

$$\text{Per Cent Modulation} = \frac{A-B}{A+B} \times 100$$

A = Peak-to-peak dimensions

B = Mode-to-mode dimensions

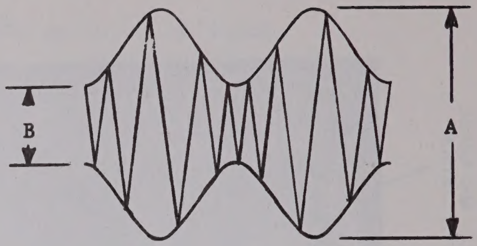


Figure 5-5. Per Cent Modulation

5-32. MODULATOR RESPONSE.

a. Leave equipment connected and adjusted as described in steps a through d of paragraph 5-31. Make sure that oscillator output is 0.25 volts as indicated on the audio vtvm and that MOD LEVEL control R1512 is set to full counterclockwise position.

b. Then disconnect audio vtvm from jacks J18 and J19 and connect across test panel METER jacks J20 and J21 (see figure 5-2).

c. Set test panel PTT switch S1 to ON position, refer to figure 5-4, and adjust MIC LEVEL control R1509 for a modulation pattern of approximately 50 per cent on the oscilloscope.

d. Vary audio oscillator frequency from 300 to 3000 cps and record frequency at which maximum voltage is obtained on the audio vtvm.

e. Tune audio oscillator to the frequency recorded in preceding step d and adjust control R1509 for a modulation pattern of 85 per cent on the oscilloscope. Compute per cent modulation as shown in figure 5-5.

f. Vary oscillator frequency from 300 to 3000 cps, maintaining modulation constant at 85 per cent with control R1509, and note change in output indication on the audio vtvm. Output indication should not vary by more than 6 db over the 300- to 3000-cps range.

g. Adjust control R1509 for a 100 per cent modulation pattern on the oscilloscope; then adjust MOD LEVEL control R1512 for a modulation pattern of 90 per cent (see figure 5-5). Set test panel PTT switch S1 to OFF position.

h. Disconnect audio vtvm from jacks J20 and J21 and reconnect across MIKE INPUT jacks J18 and J19.

5-33. SIDETONE.

a. Leave equipment connected and adjusted as described in steps a through d of paragraph 5-31. Make sure that oscillator output is 0.25 volts as indicated on the audio vtvm and that MOD LEVEL control R1512 is set to full counterclockwise position.

b. Connect the audio output meter across test panel SIDETONE OUTPUT jacks J6 and J7 and set meter load selector switch to 500-ohm position.

c. Set test panel PTT switch S1 to ON position, refer to figure 5-4, and adjust MIC LEVEL control R1509 for a modulation pattern of 100 per cent on the oscilloscope.

d. Refer to figure 5-6 and adjust SIDETONE LEVEL control R1401 for a 100-milliwatt indication on the audio output meter. Sidetone output should be 100 milliwatts or better.

e. Adjust MOD LEVEL control R1512 for a modulation pattern of 90 per cent on the oscilloscope (see figure 5-5) and adjust control R1401 for a 25-milliwatt indication on the audio output meter.

f. Set PTT switch S1 to OFF position.

5-34. FINAL PROCEDURE.

a. Disconnect all test equipment from the test panel.

b. Close the two 'hinged' circuit boards at the right side of the center chassis and tighten quarter-turn fasteners.

5-35. RECEIVER ADJUSTMENTS.

5-36. PREPARATION FOR ADJUSTMENT. Make sure that the transceiver is connected and that test panel switches and controls are set as described in paragraph 5-13.

5-37. POSITIVE 20-VOLT REGULATED ADJUSTMENT.

a. Connect the dc vtvm (accurate within ±1 per cent) from the case (collector) of transistor Q1701 to chassis ground (see figure 2-6).

b. Refer to figure 5-6 and adjust REG VOLT control R1714 for a 20-volt indication on the dc vtvm.

c. Disconnect the dc vtvm from the transceiver.

5-38. IF GAIN, AUDIO LEVEL, AND DATA LEVEL ADJUSTMENT. Complete the following steps to adjust IF GAIN control R201, AUDIO LEVEL control R308, and DATA LEVEL control R301:

a. Connect audio output meter to test panel RCVR OUTPUT jacks J8 and J9 and the vhf generator to test panel ANTENNA receptacle J1 through the 6-db pad with 50-ohm coaxial cable (see figure 5-2).

b. Energize the generator and set load selector switch on audio output meter to 500-ohm position.

c. Adjust the vhf generator for a 132.500-mc signal, modulated 90 per cent at 1000 cps and set the output level to zero.

d. Tune the control unit to 132.500 mc and place test panel SQUELCH DISABLE switch S4 in ON position (see figure 5-2).

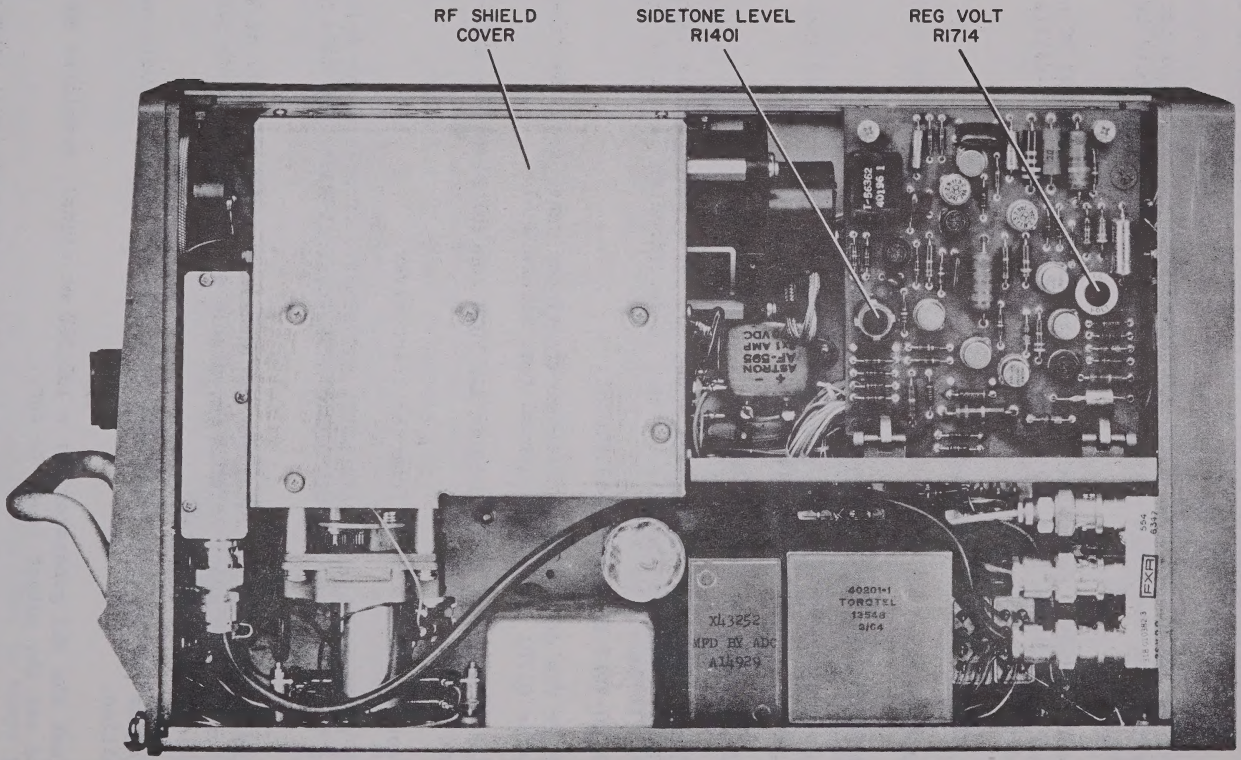

RF SHIELD COVER
SIDETONE LEVEL R1401
REG VOLT R1714

Figure 5-6. VHF Transceiver Series 807, Adjustment Locations

e. Slowly increase the generator output level until receiver agc action is initiated. This action is indicated on the audio output meter when the meter indication ceases to increase with the increase in generator output level.

f. Then decrease the generator output level to a point just below the level at which the meter indication starts to decrease. This point is just below the knee of the receiver agc characteristic.

g. Tune the control unit and generator from 116.000 through 149.000 mc in 1-mc steps and record indication of the audio output meter at each frequency.

h. Set the control unit and generator to the frequency at which the lowest output indication was noted in preceding step g. Then tune the control unit and generator through the 0.1-mc steps and record indication of the audio output meter at each frequency.

i. Set the control unit and generator to the frequency at which the lowest output indication was noted in preceding step h. Then tune the control unit and generator through the 25-kc steps of this frequency and record indication of the audio output meter at each frequency.

j. Tune the control unit and generator to the frequency at which the lowest output indication was noted in preceding step i and set test panel SQUELCH DISABLE switch S4 to OFF position.

k. Release quarter-turn fasteners at the top and front of the receiver chassis and swing chassis outward from the transceiver.

l. Refer to figure 5-3, turn IF GAIN control R201 to full counterclockwise position, and adjust generator output level to 3 microvolts.

m. Adjust control R201 in a clockwise direction until an indication is just obtained on the audio output meter, indicating receiver squelch has opened. Decrease generator output level to check that receiver squelch closes under the 3-microvolt level.

n. Set generator output level to 3 microvolts, refer to figure 5-3, and adjust AUDIO LEVEL control R308 for a 100-milliwatt indication on the audio output meter.

o. Connect the audio vtvm on the 1-volt range across test panel DATA LINK OUTPUT jacks J16 and J17.

p. Decrease generator modulation to 30 per cent and increase generator output level to 1000 microvolts.

q. Refer to figure 5-3 and adjust DATA LEVEL control R301 for a 0.25-volt indication on the audio vtvm.

r. Disconnect the generator, 6-db pad, audio output meter, and audio vtvm from the test panel.

s. Close the receiver chassis and tighten the quarter-turn fasteners.

5-39. CALIBRATION OF LOW AND HIGH UNIT'S OSCILLATOR.

a. Refer to figure 2-1, remove the retaining screws from the receiver chassis cover, and remove the cover.

b. Construct a dummy crystal as shown in figure 5-7. Observe critical terminal lead lengths of 1/2-inch and make lead lengths at the junction of the capacitor and resistor as short as possible.

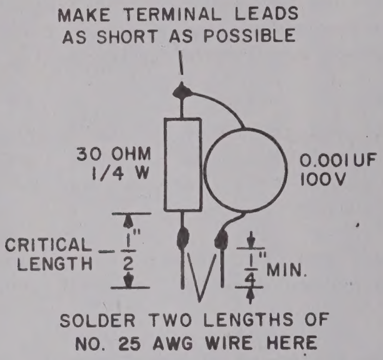

MAKE TERMINAL LEADS AS SHORT AS POSSIBLE
30 OHM 1/4 W
0.001 UF 100V
CRITICAL LENGTH 1/2"
1/4" MIN.
SOLDER TWO LENGTHS OF NO. 25 AWG WIRE HERE

Figure 5-7. Dummy Crystal

Refer to figure 5-8 and replace crystal Y403 with the dummy crystal. Make sure that the dummy crystal is seated firmly in the socket.

d. Connect the frequency counter (525A converter) to HIGH UNIT'S test point through a coupling capacitor of approximately 30 uuf (use minimum amount of capacity as possible and still obtain sufficient signal to drive counter).

e. Tune the control unit to 135.000 mc, refer to figure 5-8, and adjust coil L401 until a frequency counter indication of 59.7 mc, ±0.001 per cent, is obtained.

f. Replace the dummy crystal with crystal Y403, removed in preceding step c.

g. Tune the control unit from 130.000 through 139.000 mc in 1-mc steps and note indicated frequency on the counter at each step. All frequencies should fall within ±0.003 per cent of the high unit's oscillator frequencies listed for the 1-mc steps in Table 4-1.

h. Replace crystal Y413 with the dummy crystal. Make sure that the dummy crystal is seated firmly in the socket.

i. Connect the frequency counter to LOW UNIT'S test point through the coupling capacitor.

j. Tune the control unit to 125.000 mc and adjust coil L402 until a frequency counter indication of 54.7 mc, ±0.001 per cent, is obtained.

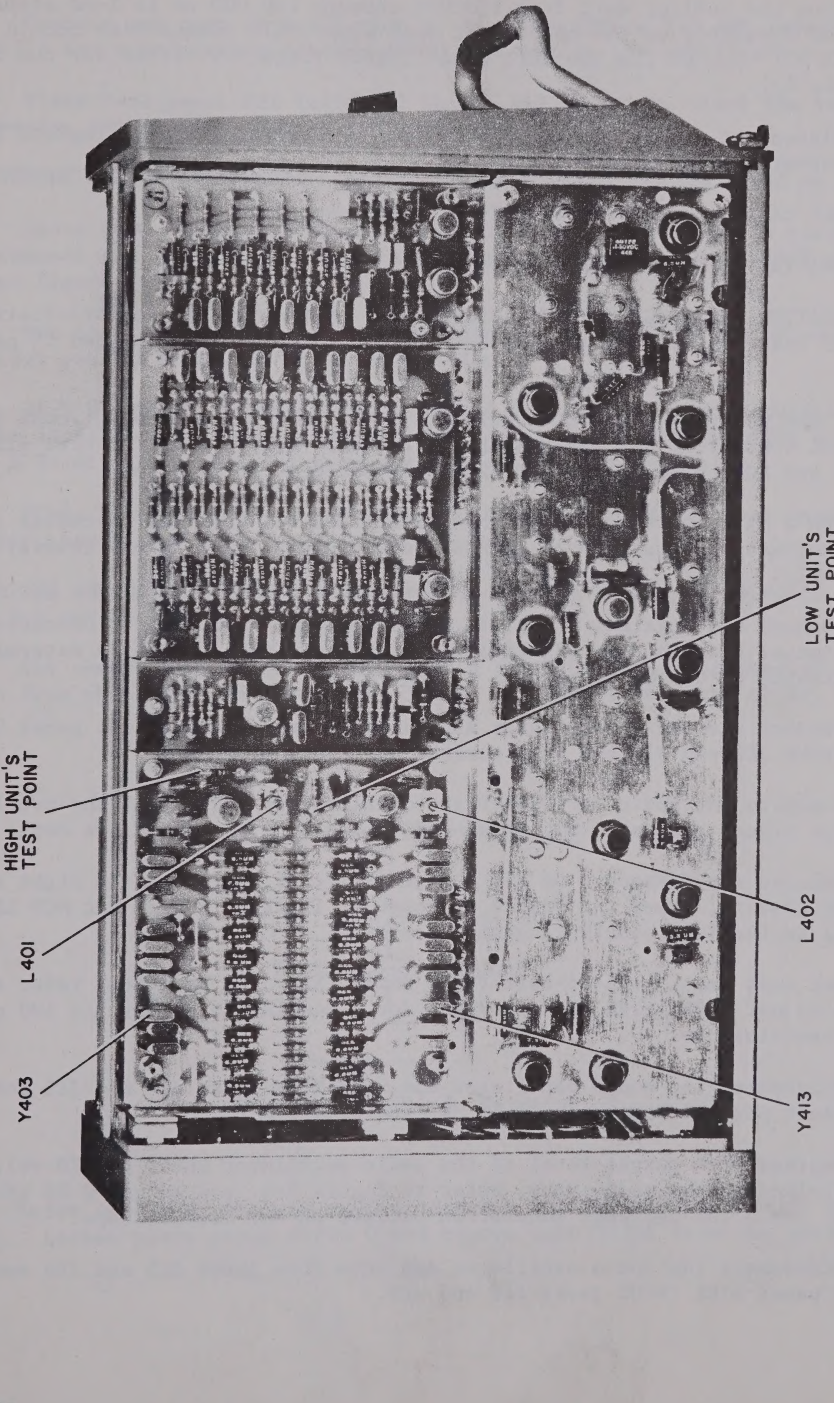

HIGH UNIT'S TEST POINT
L401
Y403
LOW UNIT'S TEST POINT
L402
Y413

Figure 5-8. VHF Transceiver Series 807, Adjustment Locations

k. Replace the dummy crystal with crystal Y413, removed in preceding step h.

l. Tune the control unit from 120.000 through 129.000 mc in 1-mc steps and note indicated frequency on the counter at each step. All frequencies should fall within ±0.003 per cent of the low unit's oscillator frequency listed for the 1-mc steps in Table 4-1.

m. Disconnect the frequency counter from the transceiver and replace and secure the receiver chassis shield cover.

n. Set control COMM OFF/PWR switch to OFF position.

5-40. TRANSMITTER ALIGNMENT AND ADJUSTMENT.

5-41. PREPARATION FOR ALIGNMENT AND ADJUSTMENT. Make sure that the transceiver is connected and that test panel switches and controls are set as described in paragraph 5-13.

5-42. INPUT AND MODULATION LEVEL ADJUSTMENTS. Complete the following steps to adjust MIC LEVEL control R1509, 0 DB LEVEL control R1507, DATA LEVEL control R1505 for proper input and MOD LEVEL control R1512 for 90 per cent modulation:

a. Use a 'T' connector on the input receptacle of the load wattmeter and connect the wattmeter to test panel ANTENNA receptacle J1 with 50-ohm coaxial cable. (See figure 5-2.)

b. Connect the vertical plates of the oscilloscope to the 'T' connector on the load wattmeter through a 2-watt rf attenuator whose ohmic value is determined by the sensitivity of the oscilloscope.

c. Connect the audio oscillator and the audio vtvm across test panel DATA LINK INPUT jacks J10 and J11 and tune control unit to 132.500 mc.

d. Energize the audio oscillator and oscilloscope and adjust the oscillator for a 1000-cps signal and an output level indication of 1.0 volt on the audio vtvm.

e. Release the fasteners on the 'hinged' circuit boards on the right side of the center chassis, lower the boards as shown in figure 5-4, and set MOD LEVEL control R1512 to the full counterclockwise position.

f. Set test panel push-to-talk (PTT) switch S1 to ON position, refer to figure 5-4, and adjust DATA LEVEL control R1505 for a modulation pattern of 100 per cent on the oscilloscope.

g. Disconnect the audio oscillator and vtvm from jacks J11 and J12 and connect across test panel 0 DBM input jacks J13 and J14.

h. Decrease the output level of the audio oscillator until a 0.70-volt indication is obtained on the audio vtvm, refer to figure 5-4, and adjust 0 DB LEVEL control R1507 for a 100 per cent modulation pattern on the oscilloscope.

i. Disconnect the audio oscillator and vtvm from jacks J13 and J14 and connect to test panel MIKE INPUT jacks J18 and J19.

j. Decrease oscillator output level until a 0.25-volt indication is obtained on the audio vtvm, refer to figure 5-5, and adjust MIC LEVEL control R1509 for a modulation pattern of 100 per cent on the oscilloscope.

k. Compute per cent of modulation as shown in figure 5-5 and adjust MOD LEVEL control R1512 for a modulation pattern of 90 per cent on the oscilloscope.

l. Place test panel PTT switch S1 in the OFF position, close the two 'hinged' circuit boards, and tighten quarter-turn fasteners.

5-43. SIDETONE OUTPUT ADJUSTMENT. Adjust SIDETONE LEVEL control R1401 as follows:

a. Leave test equipment connected and adjusted as described in paragraph 5-42 and connect the audio output meter across test panel SIDETONE OUTPUT jacks J6 and J7 (see figure 5-2).

b. Set load selector switch on the audio output meter to the 500-ohm position and test panel PTT switch S1 to ON position.

c. With MOD LEVEL control R1512 adjusted for a 90 per cent modulation pattern on the oscilloscope, refer to figure 5-6, and adjust SIDETONE LEVEL control R1401 for a 25-milliwatt indication on the audio output meter.

d. Place PTT switch S1 to OFF position and disconnect all test equipment from the test panel.

5-44. EXCITER AND DRIVER/AMPLIFIER ALIGNMENT. Construct a diode detector as shown in figure 5-9 and proceed as follows:

a. Set control unit COMM OFF/PWR switch to OFF position, remove the retaining screws from the rf shield cover (see figure 5-6) and remove the cover.

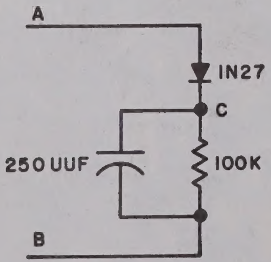


Figure 5-9. Diode Detector

b. Refer to figure 5-4 and remove screws A and B from the base of final amplifier V1201. Loosen plate strap screw C and remove tube V1201 from the socket.

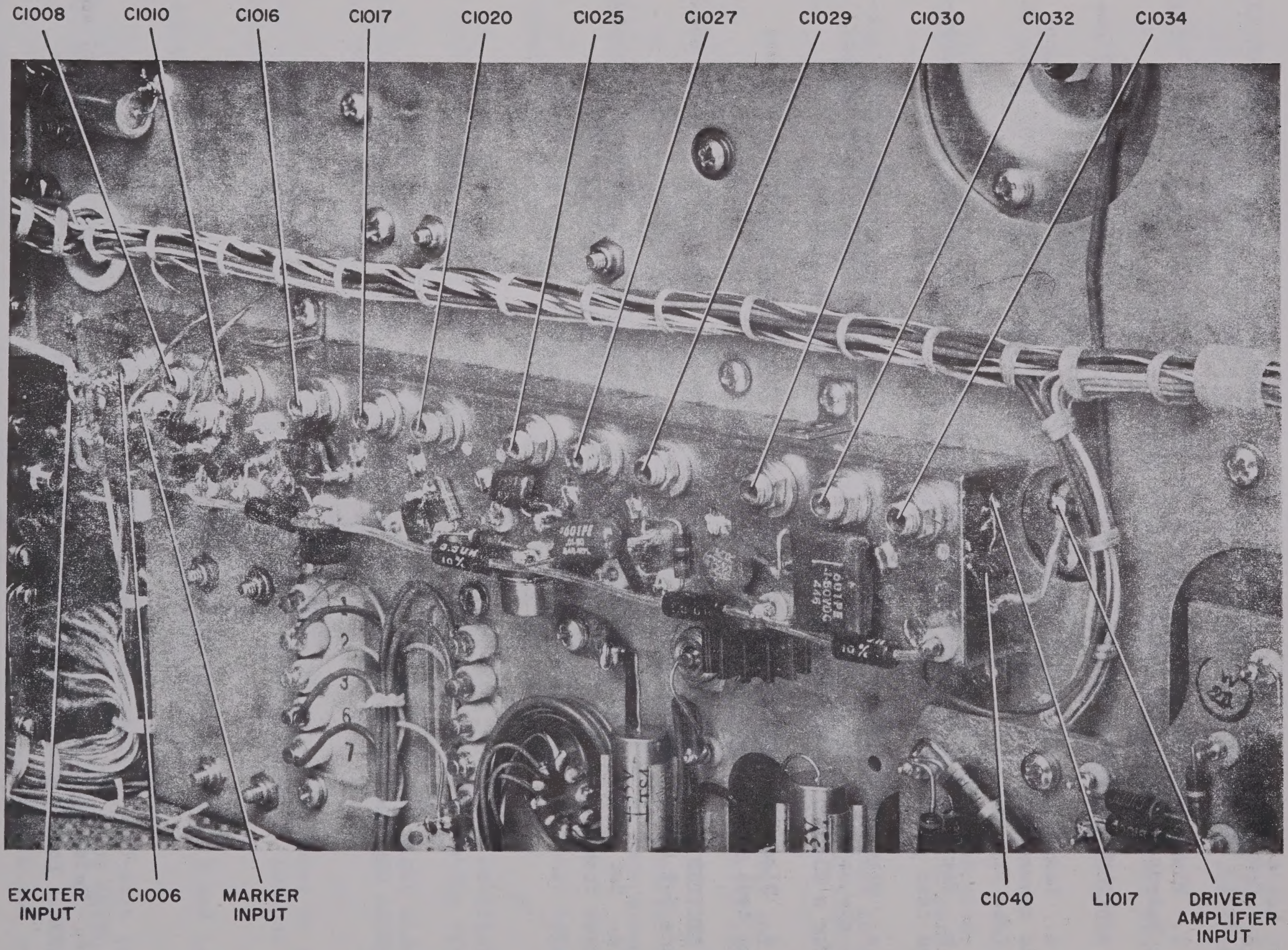

C1008
C1010
C1016
C1017
C1020
C1025
C1027
C1029
C1030
C1032
C1034
EXCITER INPUT
C1006
MARKER INPUT
C1040
L1017
DRIVER AMPLIFIER INPUT

Figure 5-10. VHF Transceiver Series 807, Adjustment Locations

c. Release four fasteners securing the receiver chassis and swing chassis outward on attached hinges. Unsolder the shielded wire from the EXCITER INPUT feed-through insulator (see figure 5-10) and connect the output of the sweep generator to the insulator.

d. Unsolder capacitor C1040 from the top of coil L1017 (see figure 5-10) and solder a 1000-ohm resistor from the top of coil L1C17 to ground.

e. Unsolder the exciter output lead from the DRIVER/AMPLIFIER INPUT feed-through insulator (see figure 5-10) and solder lead A of the diode detector to the top of coil L1017 and lead B to chassis ground (see figure 5-9).

f. Connect the vertical input of the oscilloscope to detector point C and the oscilloscope horizontal input to the sweep generator horizontal output.

g. Connect the output of the vhf generator to the MARKER INPUT feed-through insulator (see figure 5-10) and energize the sweep generator, oscilloscope, and vhf generator.

h. Set control unit COMM OFF/PWR switch to PWR position, place test panel PTT switch S1 in ON position, and adjust the output level of the sweep generator to 150 millivolts (rms).

i. Using the output of the vhf generator as a marker, observe the oscilloscope and adjust the sweep generator to display a sweep pattern from 116.000 through 150.000 mc, centered at 132.000 mc.

j. The sweep pattern (exciter response) should be essentially flat between the marker locations of 116.000 and 150.000 mc and the trace amplitude should not be less than 20-volts peak as shown in figure 5-11.

k. If the exciter response pattern is not as specified in preceding step j, refer to figure 5-10 and adjust the following capacitors until a response pattern similar to the typical pattern shown in figure 5-11 is obtained: C1034, C1032, C1030, C1029, C1027, C1025, C1020, C1017, C1016, C1010, C1008, and C1006.

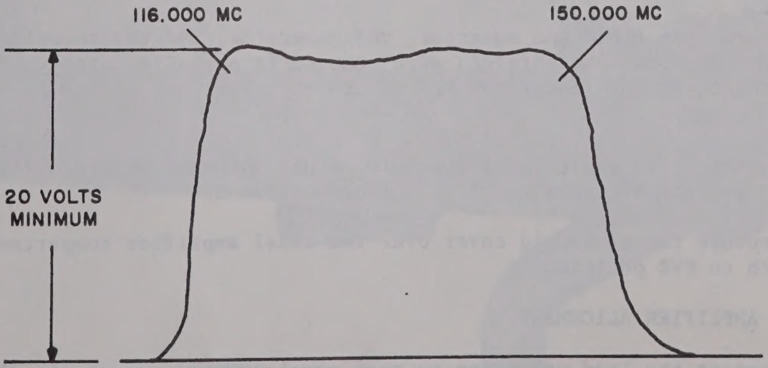


Figure 5-11. Typical Exciter Response Pattern

l. Tune the control unit to the frequency at which the setscrews on the motor positioner drive shaft are positioned as shown in figure 5-4. Record frequency indicated on control unit.

m. Set PTT switch S1 and the COMM OFF/PWR switch to the OFF position. Use a pencil and mark the fixed contact which is engaged with the moving contact on the top wafer of the motor positioner switch. (See figure 5-4.)

n. Loosen the two setscrews on the positioner drive shaft and rotate the shaft until the moving contacts of the top and bottom wafers are disengaged from the fixed contacts.

o. Unsolder the 1000-ohm resistor and diode detector from the top of coil L1017 and chassis ground. Resolder capacitor C1014 to the top of coil L1017 and the exciter output lead to the DRIVER/AMPLIFIER INPUT feed-through insulator (see figure 5-10).

p. Refer to figure 5-12 and solder lead A of the diode detector to the collector of Q1102 and lead B to the 35-VOLT feed-through insulator (junction of coil L1104 and capacitor C1116). Connect the vertical input of the scope to detector point C.

q. Set COMM OFF/PWR switch to PWR and PTT switch S1 to ON positions and observe drive/amplifier response pattern on the oscilloscope. The response pattern should be slightly rounded between the marker locations of 116.000 and 150.000 mc and the trace amplitude should not be less than 20 volts at the marker locations as shown in figure 5-13.

r. If the driver/amplifier response is not as specified in preceding step q, refer to figure 5-12 and adjust coils L1105, L1103, and L1102 and the capacitors of preceding step k until a response pattern similar to the typical pattern shown in figure 5-13 is obtained.

s. Make sure that the control unit is tuned to the frequency recorded in preceding step l and set PTT switch S1 and the OFF/PWR switch to the OFF positions.

t. Rotate the shaft of the motor positioner switch until the moving contact is engaged with the fixed contact marked in preceding step m and tighten the setscrews on the shaft.

u. Disconnect the diode detector, vhf generator, and the sweep generator from the unit. Resolder the shielded wire removed in preceding step c to the EXCITER INPUT feed-through insulator and secure the receiver chassis to the main chassis.

v. Insert final amplifier V1201 into socket through the plate strap. (See figure 5-4.) Replace screws A and B and tighten screw C.

w. Replace the rf shield cover over the final amplifier compartment and set OFF/PWR switch to PWR position.

5-45. FINAL AMPLIFIER ALIGNMENT.

a. Connect the load wattmeter to test panel ANTENNA receptacle J1 and set meter switch S1902 to PA GRID I position (see figure 5-1).

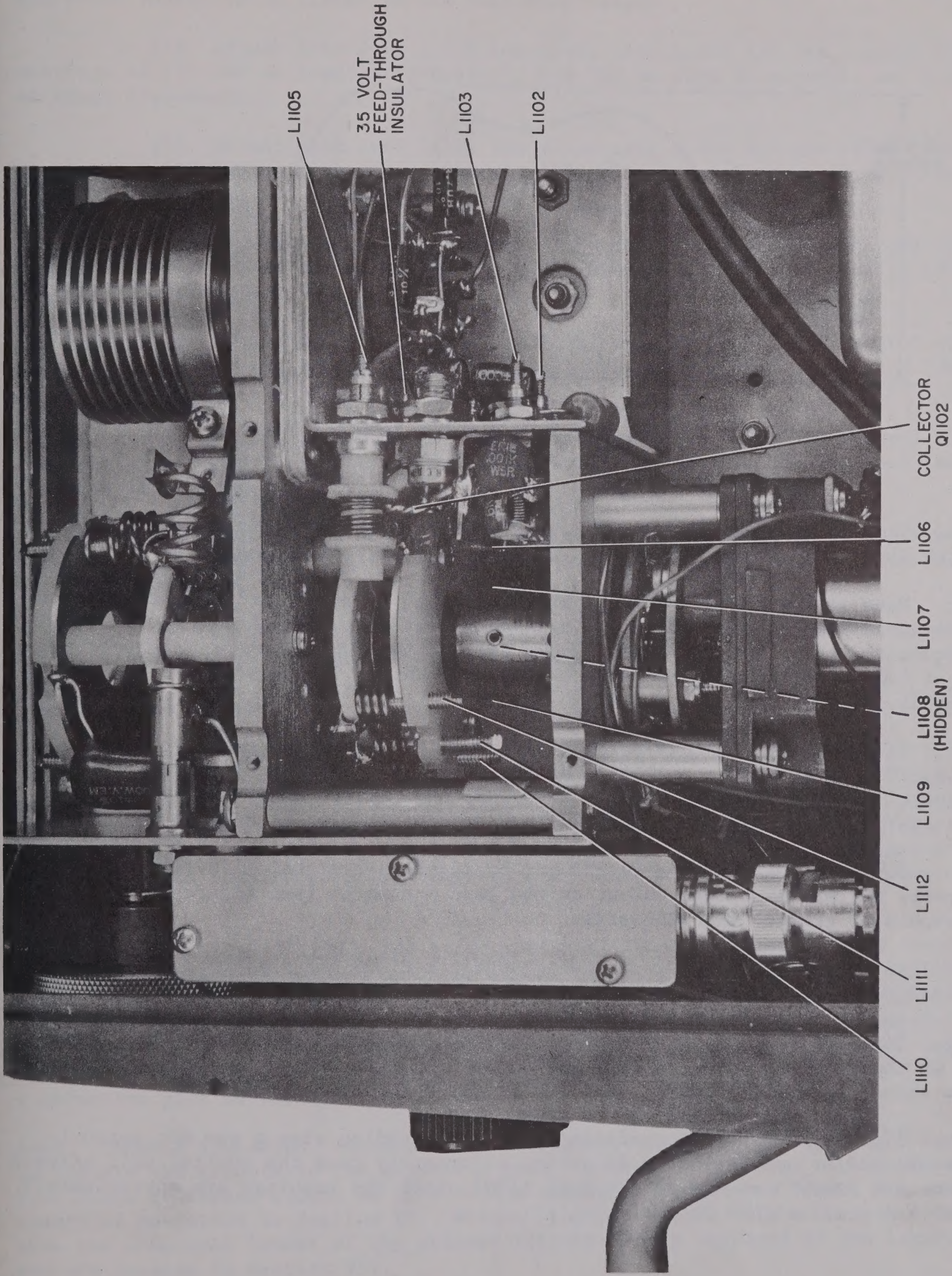

L1105
35 VOLT FEED-THROUGH INSULATOR
L1103
L1102
COLLECTOR Q1102
L1106
L1107
L1108 (HIDDEN)
L1109
L1112
L1111
L1110

Figure 5-12. VHF Transceiver Series 807, Adjustment Locations

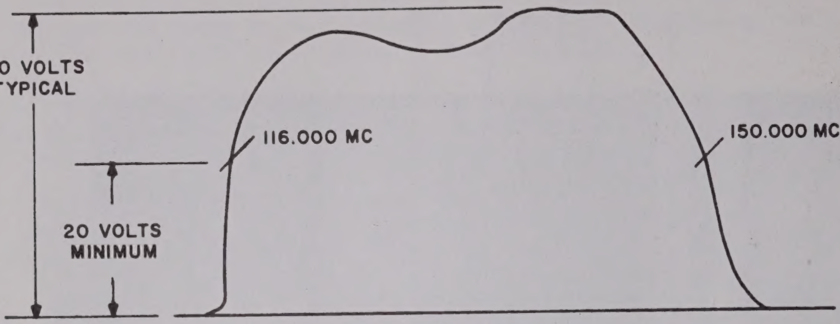


Figure 5-13. Typical Driver/Amplifier Response Pattern

b. Tune control unit to 132.500 mc (center frequency) and place test panel PTT switch S1 to the ON position.

c. Note indication of meter M1 at 132.500 mc. Tune control unit to the following frequencies and note indication of meter M1 at each frequency: 130.000 mc (low frequency) and 134.975 mc (high frequency). Meter indication on M1 should be maximum at 132.500 mc and the readings at 130.000 and 134.975 mc should be approximately equal.

d. If the meter readings are not as specified in preceding step c, remove the rf shield cover from the amplifier compartment (see figure 5-6), make a slight adjustment of grid coil L1109 (see figure 5-12), and replace cover with two screws. Repeat steps c and d until meter readings are as specified in step c.

e. Tune control unit to 132.500 mc and adjust plate coil L1207 through the shield cover for maximum power output on the load wattmeter (see figure 5-4). Power output should be greater than 25 watts.

f. Refer to figure 5-1 and adjust capacitor C1208 for maximum power output on the load wattmeter.

g. Tune the control unit to the following frequencies and note power output reading on the load wattmeter at each frequency: 130.000 and 134.975 mc. The two readings should be approximately equal and be greater than 25 watts.

h. If the power output readings noted in preceding step g are not approximately equal and/or are less than 25 watts, alternately tune the control unit between 130.000 mc and 134.975 mc and adjust coil L1207 until the readings are approximately equal and are greater than 25 watts.

i. Repeat preceding steps b through h, omitting step f, for each set of grid and plate tuning coils listed in the following steps:

(1) Adjust grid coil L1112 and plate coil L1210 and use control unit settings of 118.500 mc (center frequency), 116.000 mc (low frequency), and 119.975 mc (high frequency).

(2) Adjust grid coil L1111 and plate coil L1209 and use control unit settings of 122.500 mc (center frequency), 120.000 mc (low frequency), and 124.975 mc (high frequency).

(3) Adjust grid coil L1110 and plate coil L1208 and use control unit settings of 127.500 mc (center frequency), 125.000 mc (low frequency), and 129.975 mc (high frequency).

(4) Adjust grid coil L1108 and plate coil L1206 and use control unit settings of 137.500 mc (center frequency), 135.000 mc (low frequency), and 139.975 mc (high frequency).

(5) Adjust grid coil L1107 and plate coil L1205 and use control unit settings of 142.500 mc (center frequency), 140.000 mc (low frequency), and 144.975 mc (high frequency).

(6) Adjust grid coil L1106 and plate coil L1204 and use control unit settings of 147.500 mc (center frequency), 145.000 mc (low frequency), and 147.975 mc (high frequency).

j. Set PTT switch S1 to the OFF position and disconnect the load wattmeter from the test panel. Replace and tighten all screws in the rf shield cover.

5-46. TROUBLE SHOOTING.

5-47. Two basic procedures are used in trouble shooting the transceiver: localization and isolation of a trouble. Localization is tracing the trouble to the circuit responsible for abnormal operation. Isolation is tracing the trouble to the defective component part responsible for abnormal operation. Quite frequently the source of trouble can be isolated by inspecting component parts and wiring. Generally the trouble must be located by using test equipment and in some cases by component substitution.

5-48. TROUBLE LOCALIZATION. The localization of trouble is most easily accomplished by completing the preliminary test procedures of paragraph 5-14 and applicable parts of the receiver and transmitter performance test and adjustment procedures given in paragraphs 5-16 through 5-45. The result of each procedure should be compared with the normal result or indication specified. The point at which an abnormal result or indication is obtained is frequently indicative of the assembly or circuit in which a defective part is located.

5-49. TROUBLE ISOLATION. Conventional trouble shooting procedures should be used to isolate the trouble to the defective part. During the process of trouble shooting continuous reference should be made to the schematic diagram of figure 7-1 and the theory of operation in Section IV. Wilcox drawing numbers 117416 through 117425 show the component layout of the printed circuit boards employed in the transceiver and are located in Section VII.

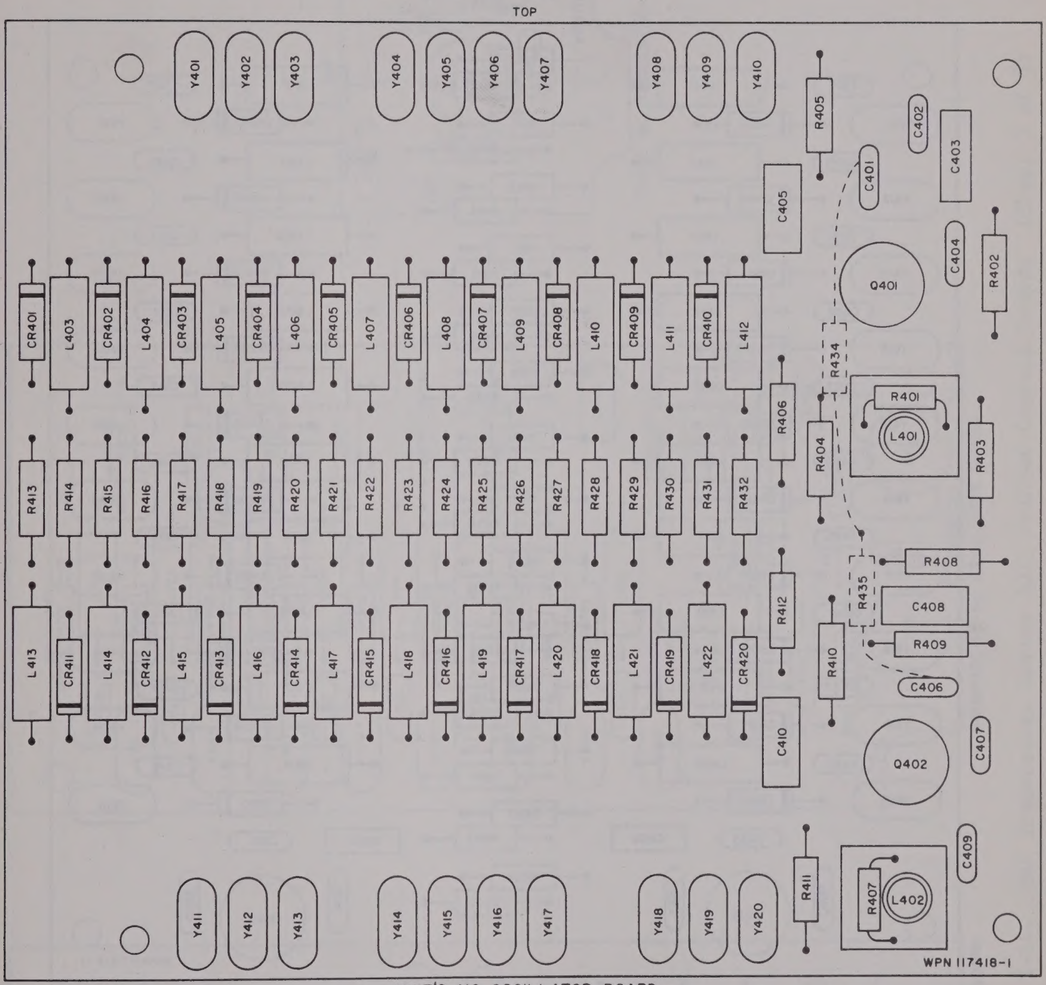
5-50. FINAL PROCEDURE.

5-51. After corrective maintenance procedures have been completed and the equipment is determined to be in satisfactory operating condition, complete the following steps:

a. Set the control unit COMM OFF/PWR switch to OFF and make sure that all test equipment is disconnected from the transceiver.

b. Disconnect the transceiver from the test panel and check to see that all shield covers and 'hinged' circuit boards and chassis are fastened in place.

c. Replace the two protective side covers on the transceiver and secure in place by tightening the quarter-turn fasteners on each cover.


TOP
Y401
Y402
Y403
Y404
Y405
Y406
Y407
Y408
Y409
Y410
R405
C402
C403
C401
C405
C404
R402
Q401
CR401
L403
CR402
L404
CR403
L405
CR404
L406
CR405
L407
CR406
L408
CR407
L409
CR408
L410
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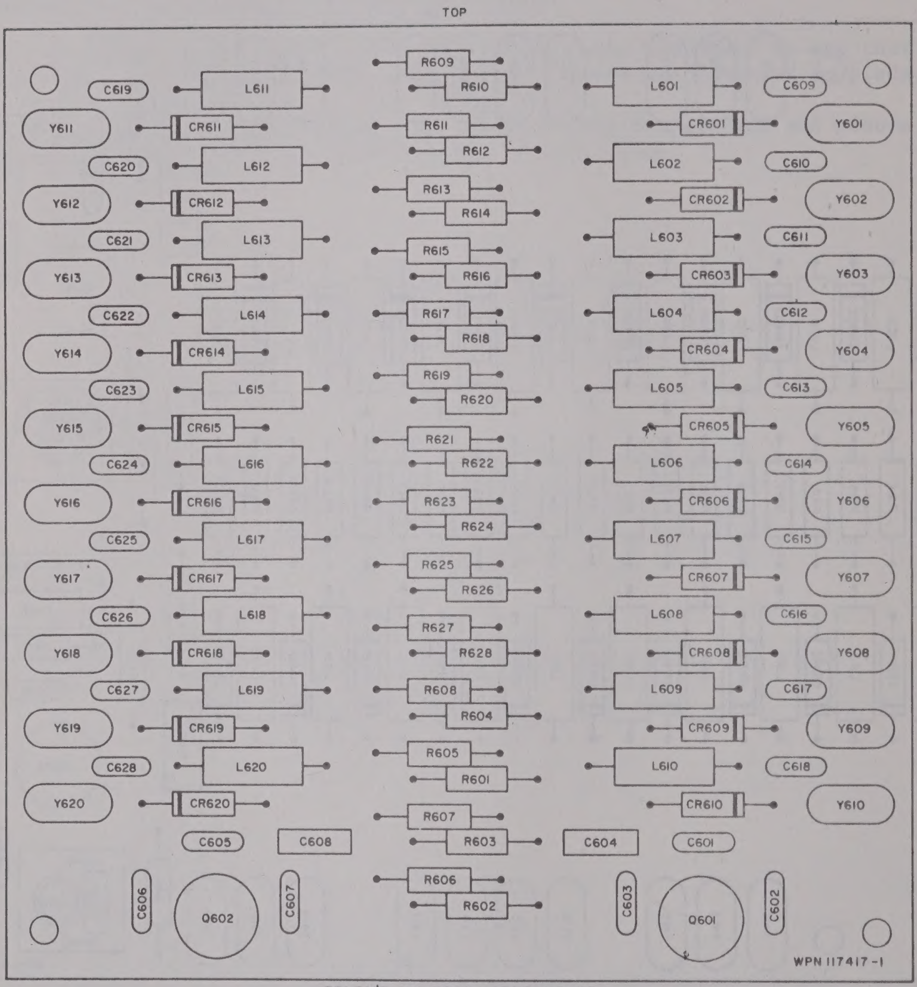
R406
R404
R403
R413
R414
R415
R416
R417
R418
R419
R420
R421
R422
R423
R424
R425
R426
R427
R428
R429
R430
R431
R432
R408
R435
C408
R412
R409
R410
C406
L413
CR411
L414
CR412
L415
CR413
L416
CR414
L417
CR415
L418
CR416
L419
CR417
L420
CR418
L421
CR419
L422
CR420
C410
Q402
C407
C409
R411
R407
L402
Y411
Y412
Y413
Y414
Y415
Y416
Y417
Y418
Y419
Y420
WPN 117418-1

UNIT'S MC OSCILLATOR BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 1 of 8)


TOP
R609
C619
L611
R610
L601
C609
Y611
CR611
R611
CR601
Y601
R612
C620
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L602
C610
R613
Y612
CR612
CR602
Y602
R614
C621
L613
L603
C611
R615
Y613
CR613
R616
CR603
Y603
C622
L614
R617
L604
C612
R618
Y614
CR614
CR604
Y604
R619
C623
L615
L605
C613
R620
Y615
CR615
CR605
Y605
R621
C624
L616
R622
L606
C614
Y616
CR616
R623
CR606
Y606
R624
C625
L617
L607
C615
R625
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C626
L618
R627
L608
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L609
C617
R604
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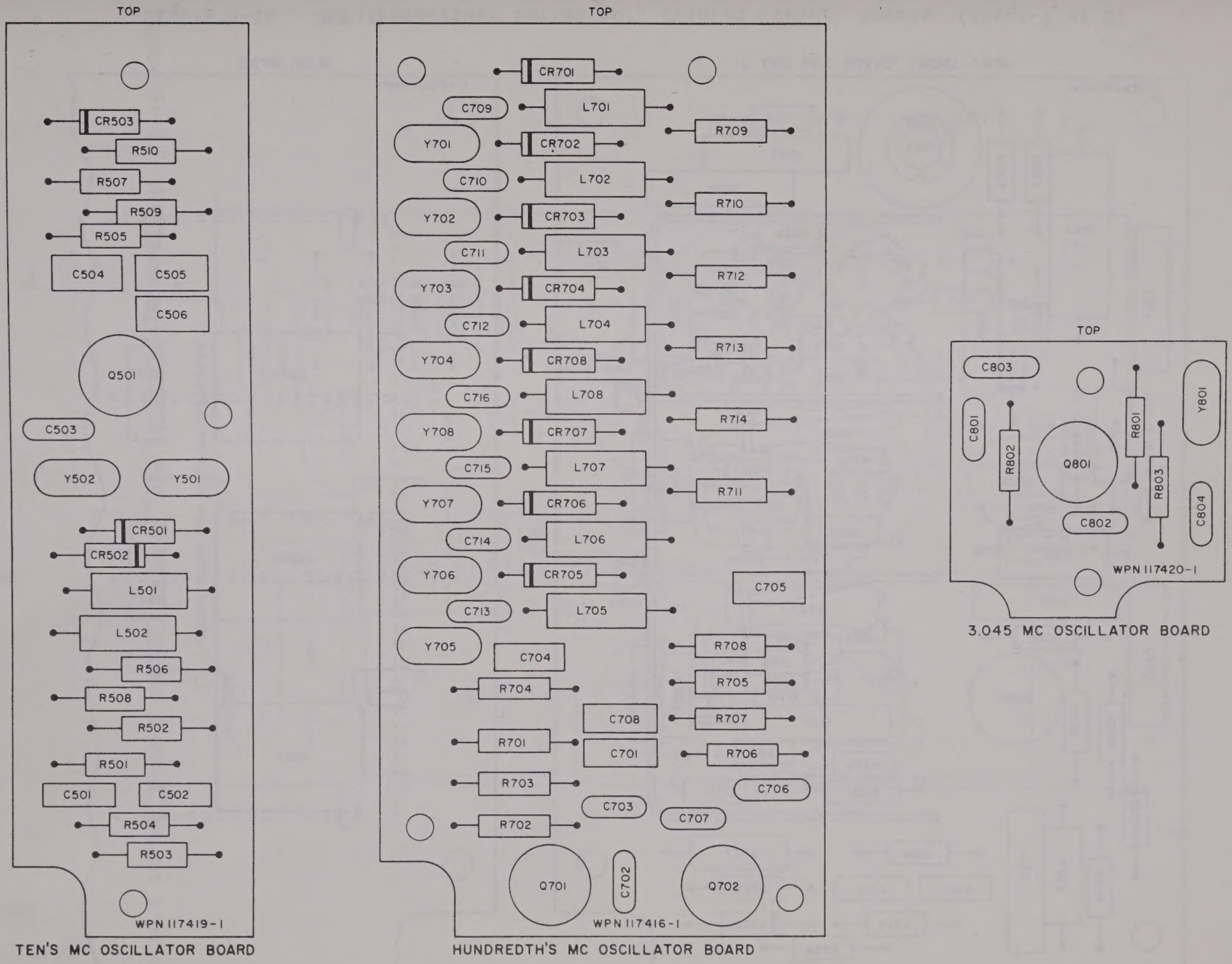
CR619
CR609
Y609
R605
C628
L620
L610
C618
R601
Y620
CR620
CR610
Y610
R607
C605
C608
R603
C604
C601
R606
C606
Q602
C607
R602
C603
Q601
C602
WPN 117417-1

TENTH'S MC OSCILLATOR BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 2 of 8)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CR503
R510
R507
R509
R505
C504
C505
C506
Q501
C503
Y502
Y501
CR501
CR502
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L502
R506
R508
R502
R501
C501
C502
R504
R503
WPN 117419-1
TOP
CR701
C709
L701
R709
Y701
CR702
C710
L702
R710
Y702
CR703
C711
L703
R712
Y703
CR704
C712
L704
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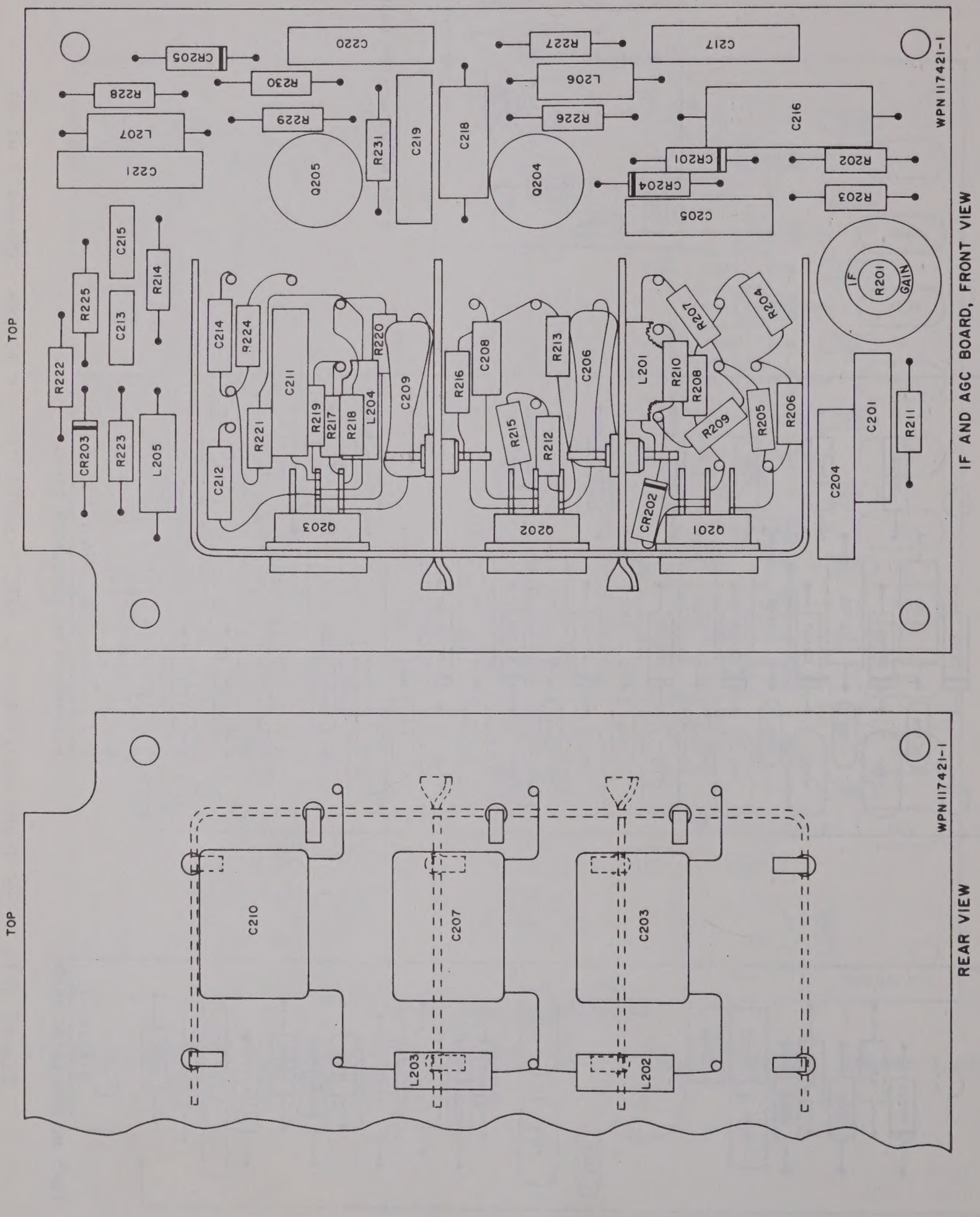
CR705
C705
C713
L705
Y705
C704
R708
R705
R704
C708
R707
R701
C701
R706
R703
C706
C703
C707
R702
Q701
C702
Q702
WPN 117416-1
TOP
C803
Y801
C801
R802
Q801
R801
R803
C804
C802
WPN 117420-1

TEN'S MC OSCILLATOR BOARD

HUNDREDTH'S MC OSCILLATOR BOARD

3.045 MC OSCILLATOR BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 3 of 8)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C221
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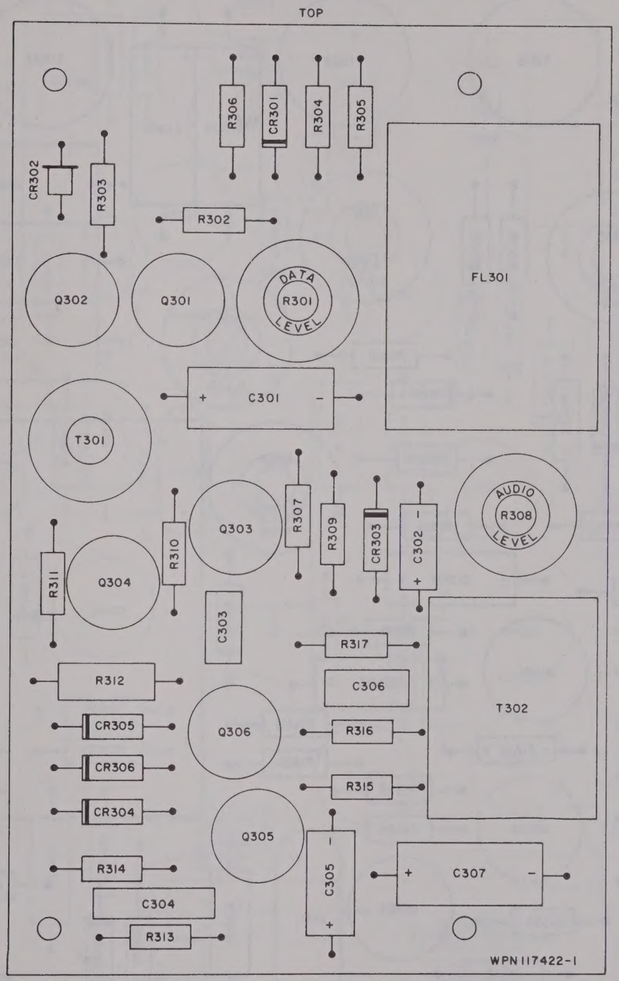
R228
CR205
R230
R229
C220
Q205
R231
C219
C218
R227
L206
R226
Q204
C217
C216
CR201
R202
CR204
R203
C205
WPN 117421-1
C215
R225
R214
C213
R222
CR203
R223
L205
C214
R224
C212
R221
C211
R219
R217
R218
L204
R220
C209
Q203
R216
C208
R215
R212
R213
C206
Q202
L201
R210
R208
R207
R204
R209
R205
R206
CR202
Q201
IF
R201
GAIN
C201
R211
C204
TOP
WPN 117421-1
C210
C207
C203
L203
L202

IF AND AGC BOARD, FRONT VIEW

REAR VIEW

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 4 of 8)


TOP
R306
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R304
R305
CR302
R303
R302
FL301
Q302
Q301
DATA
R301
LEVEL
C301
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R308
LEVEL
Q303
R307
R309
CR303
C302
R311
Q304
R310
C303
R317
R312
C306
T302
CR305
Q306
R316
CR306
R315
CR304
Q305
R314
C305
C307
C304
R313
WPN 117422-1

RECEIVER SQUELCH AND AUDIO BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 5 of 8)

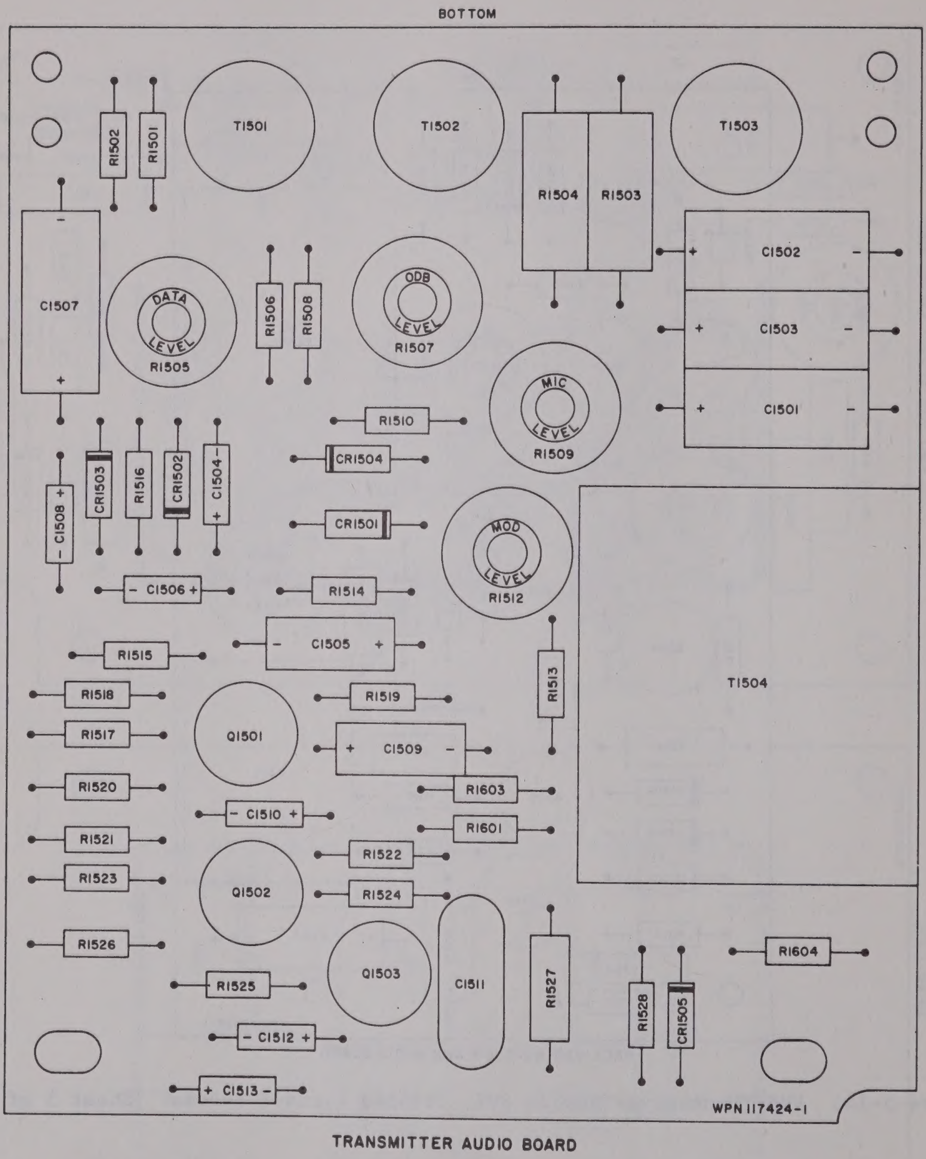
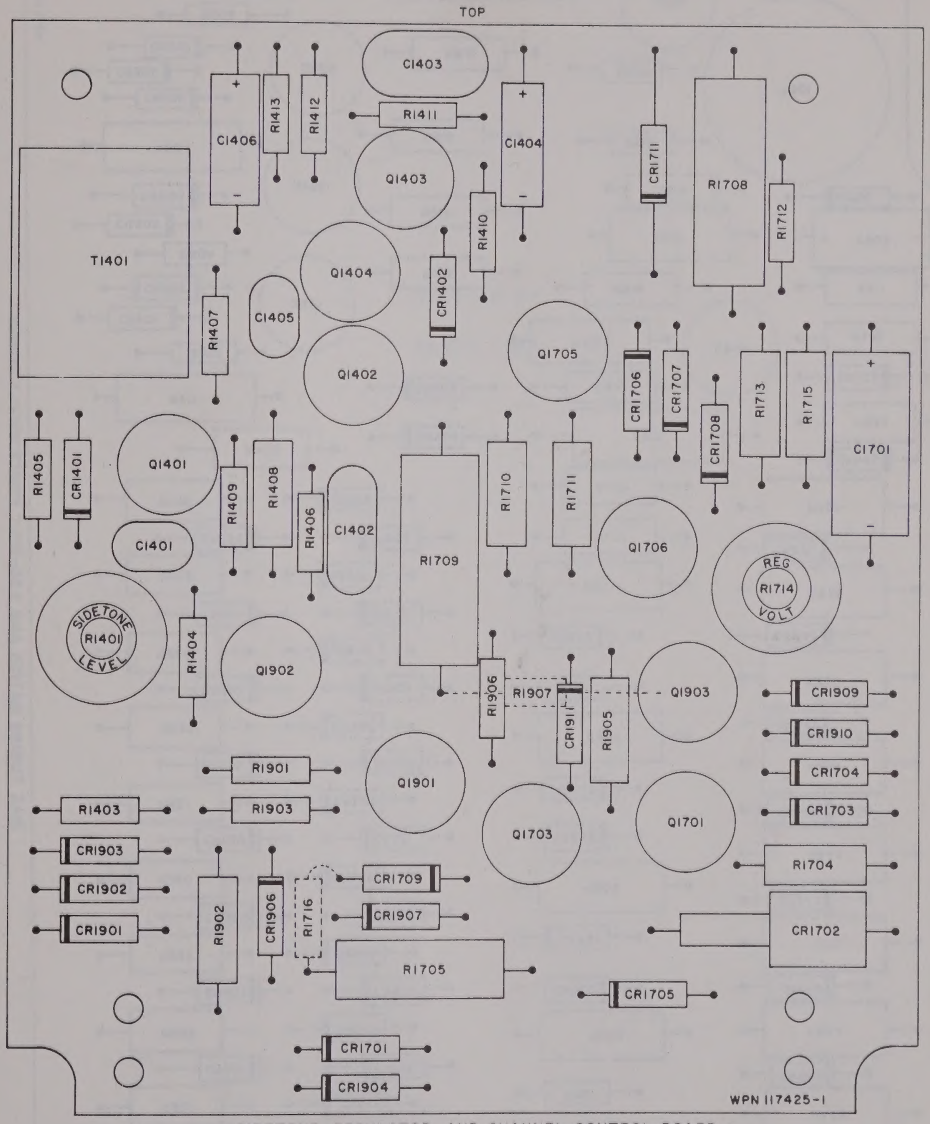

BOTTOM
T1501
T1502
T1503
R1502
R1501
R1504
R1503
C1502
C1503
C1501
C1507
DATA LEVEL
R1505
R1506
R1508
ODB LEVEL
R1507
MIC LEVEL
R1509
R1510
CR1504
CR1501
CR1503
R1516
CR1502
C1504
C1508
MOD LEVEL
R1512
C1506
R1514
C1505
R1515
R1518
R1517
R1520
R1521
R1523
R1526
R1525
Q1501
Q1502
Q1503
R1519
C1509
R1513
T1504
R1603
R1601
C1510
R1522
R1524
C1511
R1527
R1528
CR1505
R1604
C1512
C1513
WPN 117424-1
TRANSMITTER AUDIO BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 6 of 8)


TOP
C1403
R1411
R1413
R1412
C1406
Q1403
C1404
CR1711
R1708
R1712
R1410
T1401
Q1404
CR1402
C1405
R1407
Q1402
Q1705
CR1706
CR1707
R1713
R1715
CR1708
C1701
R1405
CR1401
Q1401
R1409
R1408
R1406
C1402
R1709
R1710
R1711
C1401
Q1706
REG
R1714
VOLT
SIDETONE
R1401
LEVEL
R1404
Q1902
R1906
R1907
CR1911
R1905
Q1903
CR1909
CR1910
CR1704
CR1703
R1901
R1903
Q1901
R1403
Q1703
Q1701
CR1903
CR1902
CR1901
R1902
CR1906
R1716
CR1709
CR1907
R1704
CR1702
R1705
CR1705
CR1701
CR1904
WPN 117425-1
+
-

SIDETONE, REGULATOR, AND CHANNEL CONTROL BOARD

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 7 of 8)

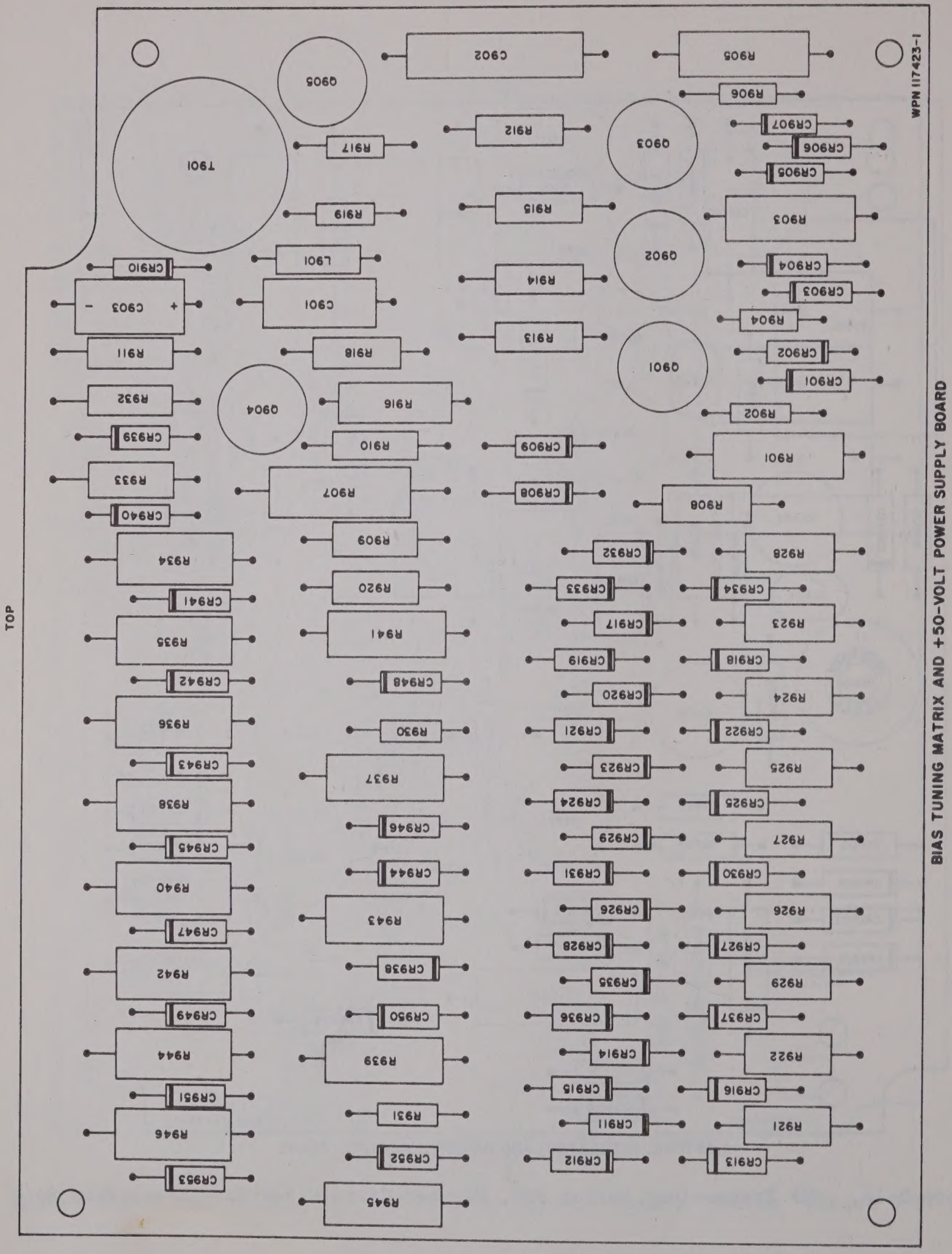

BIAS TUNING MATRIX AND +50-VOLT POWER SUPPLY BOARD
WPN 117423-1
TOP
T901
Q905
C902
R905
R906
R912
Q903
CR907
CR906
CR905
R917
R919
R915
R903
Q902
CR904
CR903
L901
CR910
C903
+
-
C901
R914
R904
R913
Q901
CR902
CR901
R911
R918
R902
R932
Q904
R916
CR939
R910
CR909
R901
R933
R907
CR908
R908
CR940
R934
R909
CR932
R928
CR941
R920
CR933
CR934
R935
R941
CR917
R923
CR942
CR948
CR919
CR918
R936
R930
CR920
R924
CR943
CR921
CR922
R938
R937
CR923
R925
CR945
CR946
CR924
CR925
R940
CR944
CR929
R927
CR947
R943
CR931
CR930
R942
CR938
CR926
R926
CR949
CR950
CR928
CR927
R944
R939
CR935
R929
CR951
R931
CR936
CR937
R946
CR952
CR914
R922
CR953
R945
CR915
CR916
CR911
R921
CR912
CR913

Figure 5-14. VHF Transceiver Series 807, Printed Circuit Boards (Sheet 8 of 8)

SECTION VI

PARTS LIST

TRANSMITTER PARTS LIST

FOR

VHF TRANSCEIVER SERIES 807, TYPE 97607

Ref Symbol	Description	Wilcox No.
B1901	FAN, VANEAXIAL: direct drive; ccw rotation; 26 vdc, 850 ma; 11,000 rpm.	245502-1
C1001	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1002	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1003	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1004	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1005	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1006	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1007	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1008	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1009	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1010	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1011	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1012	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1013	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1014	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1015	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1016	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1017	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1018	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1019	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1020	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2

Ref Symbol	Description	Wilcox No.
C1021	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1022	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1023	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1024	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1025	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1026	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1027	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1028	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±5%; 500 vdcw.	23278-1
C1029	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1030	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1031	CAPACITOR, FIXED, CERAMIC: 2.2 uuf, ±5%; 500 vdcw.	23274-1
C1032	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1033	CAPACITOR, FIXED, CERAMIC: 2.2 uuf, ±5%; 500 vdcw.	23274-1
C1034	CAPACITOR, VARIABLE, GLASS: 0.8 to 4.5 uuf; 750 vdcw.	15254-2
C1035	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1036	Not assigned.	
C1037	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 50 vdcw.	19379-1
C1038	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1039	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C1040	CAPACITOR, FIXED, MICA: 4 uuf, ±0.5 uuf; 100 vdcw.	17409-1
C1041	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1042	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1043	CAPACITOR, FIXED, MICA: 30 uuf, ±5%; 100 vdcw.	17457-2

Ref Symbol	Description	Wilcox No.
C1101	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100 -0%; 500 vdcw.	23125
C1102	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1103	CAPACITOR, FIXED, MICA: 1 uuf, ±0.5 uuf; 100 vdcw.	17428-1
C1104	CAPACITOR, FIXED, MICA: 3 uuf, ±0.5 uuf; 100 vdcw.	17434-1
C1105	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1106	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1107	CAPACITOR, FIXED, MICA: 4 uuf, ±0.5 uuf; 100 vdcw.	17409-1
C1108	CAPACITOR, FIXED, MICA: 91 uuf, ±5%; 100 vdcw. (factory selected component - typical value).	17427-2
C1109	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1110	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 80 vdcw.	19407-2
C1111	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100 -0%; 500 vdcw.	23125
C1112	CAPACITOR, FIXED, MICA: 5 uuf, ±10%; 100 vdcw.	17390-1
C1113	CAPACITOR, FIXED, MICA: 43 uuf, ±5%; 100 vdcw.	17432-2
C1114	CAPACITOR, FIXED, MICA: 62 uuf, ±5%; 100 vdcw.	17377-2
C1115	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 80 vdcw.	19407-2
C1116	CAPACITOR, FIXED, MICA: 240 uuf, ±5%; 100 vdcw.	17414-2
C1201	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100 -0%; 500 vdcw.	23125
C1202	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100 -0%; 500 vdcw.	23125
C1203	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C1204	CAPACITOR, FIXED, MICA: 1000 uuf; 500 vdcw.	17447-1
C1205	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100 -0%; 500 vdcw.	23125
C1206	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±20%; 1000 vdcw.	23276-1

Ref Symbol	Description	Wilcox No.
C1207	CAPACITOR, FIXED, MICA: 200 uuf, ±10%; 2500 vdcw.	17389-1
C1208	CAPACITOR, VARIABLE, GLASS: 0.8 to 18 uuf; 750 vdcw.	15254-4
C1209	CAPACITOR, FIXED, CERAMIC: 40 uuf, ±10%; 5000 vdcw.	23081
C1210	Not assigned.	
C1211	CAPACITOR, FIXED, CERAMIC: 240 uuf, ±10%; 1000 vdcw.	23277-1
C1212	CAPACITOR, FIXED, CERAMIC: 240 uuf, ±10%; 1000 vdcw.	23277-1
C1213	CAPACITOR, FIXED, CERAMIC: 240 uuf, ±10%; 1000 vdcw.	23277-1
C1301	CAPACITOR, FIXED, MICA: 18 uuf, ±5%; 300 vdcw.	17416-2
C1302	CAPACITOR, FIXED, MICA: 3.3 uuf, ±0.5 uuf; 300 vdcw.	17418-1
C1303	CAPACITOR, FIXED, MICA: 18 uuf, ±5%; 300 vdcw.	17416-2
C1304	CAPACITOR, FIXED, MICA: 10 uuf, ±5%; 300 vdcw.	17417-2
C1305	CAPACITOR, FIXED, MICA: 10 uuf, ±5%; 300 vdcw.	17417-2
C1306	CAPACITOR, FIXED, MICA: 10 uuf, ±5%; 300 vdcw.	17417-2
C1307	CAPACITOR, FIXED, MICA: 10 uuf, ±5%; 300 vdcw.	17417-2
C1308	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C1401	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 1.5 uf, ±10%; 35 vdcw.	21227-1
C1402	CAPACITOR, FIXED, PLASTIC: 0.033 uf, ±20%; 50 vdcw.	19365-1
C1403	CAPACITOR, FIXED, PLASTIC: 0.068 uf, ±10%; 50 vdcw.	19383-2

Ref Symbol	Description	Wilco No.
C1404	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 15 vdcw.	21240-1
C1405	CAPACITOR, FIXED, PLASTIC: 0.015 uf, ±20%; 50 vdcw.	19381-1
C1406	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 15 vdcw.	21240-1
C1501	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 35 vdcw.	21257-1
C1502	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 35 vdcw.	21257-1
C1503	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 35 vdcw.	21257-1
C1504	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 3.3 uf, ±20%; 15 vdcw.	21153-1
C1505	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±20%; 15 vdcw.	21255-1
C1506	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 3.3 uf, ±20%; 15 vdcw.	21153-1
C1507	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 27 uf, ±10%; 20 vdcw.	21182-1
C1508	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 1 uf, ±10%; 35 vdcw.	21183-1
C1509	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 27 uf, ±20%; 10 vdcw.	21262-1
C1510	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 4.7 uf, ±20%; 10 vdcw.	21256-1
C1511	CAPACITOR, FIXED, MICA: 2200 uuf, ±10%; 100 vdcw.	17386-1
C1512	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 1 uf, ±10%; 35 vdcw.	21183-1

Ref Symbol	Description	Wilcox No.
C1513	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 0.33 uf, ±10%; 35 vdcw.	21268-2
C1601	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±10%; 35 vdcw.	21196-1
C1701	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 15 uf, ±20%; 35 vdcw.	21222-2
C1801	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 22 uf, ±10%; 50 vdcw.	21267-2
C1802	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±20%; 35 vdcw.	21122-1
C1803	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 6.8 uf, ±10%; 35 vdcw.	21266-1
C1804	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±20%; 35 vdcw.	21122-1
C1805	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 1 uf, ±10%; 50 vdcw.	21243-2
C1806	Not assigned.	
C1807	Not assigned.	
C1808	CAPACITOR, FIXED, PLASTIC: 4 uf, ±20%; 300 vdcw.	19413-1
C1809	CAPACITOR, FIXED, PAPER: 4 uf, ±20%; 600 vdcw.	19414-1

Ref Symbol	Description	Wilcox No.
CR1001	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR1301	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N914.	46114-1
CR1401	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1402	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1501	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1502	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1503	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1504	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N252.	46095-1
CR1505	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N252.	46095-1
CR1701	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR1702	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1N3032B.	46106-3
CR1703	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1/4M2.4AZ.	46102-1

Ref Symbol	Description	Wilcox No.
CR1704	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR1705	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR1706	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1707	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR1708	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1N757.	46197-1
CR1709	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1710	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1711	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1801	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1N3686A.	46230-2
CR1802	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR1803	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100M.	46231-1
CR1804	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1805	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1806	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100M.	46231-1
CR1807	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100M.	46231-1
CR1808	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100M.	46231-1
CR1809	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100M.	46231-1
CR1901	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR1902	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1

Ref Symbol	Description	Wilcox No.
CR1903	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR1904	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR1905	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR1906	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1N749A.	46221-2
CR1907	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
CR1908	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR1909	SEMICONDUCTOR DEVICE, DIODE: silicon; Zener Type 1N748.	46234-1
CR1910	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR1911	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR1912	SEMICONDUCTOR DEVICE, DIODE: silicon; Type G100G.	46220-1
J2	JACK, TELEPHONE: two spring leaf contacts.	881506
J1301	CONNECTOR, RECEPTACLE: rf type; 1 round female contact; 50 ohms nom.	875503
K2001	RELAY, ARMATURE: SPDT; Coil 450 ohms; 26 vdc.	12165-1
K2002	RELAY, ARMATURE: DPDT; Coil 300 ohms; 26 vdc.	12164-1
K2003	RELAY, ARMATURE: DPDT; Coil 380 ohms; 25 vdc.	12166-1

Ref Symbol	Description	Wilcox No.
K2004	RELAY, ARMATURE: DPDT; Coil 800 ohms; 20 vdc.	12167-1
K2005	RELAY, ARMATURE: Coaxial; 3 Type BNC Connectors; DPDT; Coil 280 ohms; 26 vdc.	12163-2
L1001	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, center tapped; air wound.	38969-2
L1002	COIL, RADIO FREQUENCY: 7-1/2 turns of No. 18 AWG wire; air wound.	38969-3
L1003	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 0.73 amp dc; 0.27 ohm.	38952-15
L1004	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, tapped at 7-1/4 turns; air wound.	38970-2
L1005	COIL, RADIO FREQUENCY: 8-1/2 turns of No. 18 AWG wire, tapped at 4-3/4 turns; air wound.	38969-4
L1006	COIL, RADIO FREQUENCY: 7-1/2 turns of No. 18 AWG wire; air wound.	38969-3
L1007	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 0.73 amp dc; 0.27 ohm.	38952-15
L1008	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, tapped at 7-1/4 turns; air wound.	38970-2
L1009	Not assigned.	
L1010	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, center tapped; air wound.	38969-2
L1011	COIL, RADIO FREQUENCY: 7-1/2 turns of No. 18 AWG wire; air wound.	38969-3
L1012	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, tapped at 7-1/4 turns; air wound.	38970-2
L1013	COIL, RADIO FREQUENCY: 8-1/2 turns of No. 18 AWG wire, tapped at 4-3/4 turns; air wound.	38969-4

Ref Symbol	Description	Wilcox No.
L1014	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 0.73 amp dc; 0.27 ohm.	38952-15
L1015	COIL, RADIO FREQUENCY: 7-1/2 turns of No. 18 AWG wire; air wound.	38969-3
L1016	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 0.73 amp dc; 0.27 ohm.	38952-15
L1017	COIL, RADIO FREQUENCY: 9-1/2 turns of No. 18 AWG wire, tapped at 5-1/4 turns; air wound.	38970-3
L1101	CHOKE, RADIO FREQUENCY: 2.7 uh ±10% at 7.9 mc; 0.8 amp dc; 0.15 ohm.	38952-14
L1102	COIL, RADIO FREQUENCY: 8 turns of No. 26 AWG wire, tapped at 3-1/2 turns; ceramic coil form; slug tuned.	38966-1
L1103	COIL, RADIO FREQUENCY: 9 turns of No. 26 AWG wire, tapped at 3-1/2 turns; ceramic coil form; slug tuned.	38965-1
L1104	CHOKE, RADIO FREQUENCY: 2.7 uh ±10% at 7.9 mc; 0.8 amp dc; 0.15 ohm.	38952-14
L1105	COIL, RADIO FREQUENCY: 5 turns of No. 22 AWG wire, tapped at 1-3/4 turns; ceramic coil form; slug tuned.	38964-1
L1106	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	38967-4
L1107	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	38967-3
L1108	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	38967-2
L1109	COIL, RADIO FREQUENCY: 2 turns of No. 17 AWG wire; air wound.	38967-1
L1110	COIL, RADIO FREQUENCY: 4 turns of No. 17 AWG wire; air wound.	38968-3

Ref Symbol	Description	Wilcox No.
L1111	COIL, RADIO FREQUENCY: 4 turns of No. 17 AWG wire; air wound.	38968-2
L1112	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	38968-1
L1201	CHOKE, RADIO FREQUENCY: 2.7 uh ±10% at 7.9 mc; 0.8 amp dc; 0.15 ohm.	38952-14
L1202	COIL, RADIO FREQUENCY: 2-3/4 turns of No. 14 AWG wire; air wound.	42252-1
L1203	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 0.73 amp dc; 0.27 ohm.	38952-15
L1204	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	42248-1
L1205	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	42248-2
L1206	COIL, RADIO FREQUENCY: 3 turns of No. 17 AWG wire; air wound.	42248-3
L1207	COIL, RADIO FREQUENCY: 4 turns of No. 17 AWG wire; air wound.	42248-4
L1208	COIL, RADIO FREQUENCY: 4 turns of No. 17 AWG wire; air wound.	42247-1
L1209	COIL, RADIO FREQUENCY: 5 turns of No. 17 AWG wire; air wound.	42247-2
L1210	COIL, RADIO FREQUENCY: 5 turns of No. 17 AWG wire; air wound.	42247-3
L1211	CHOKE, RADIO FREQUENCY: 2.7 uh ±10% at 7.9 mc; 0.8 amp dc; 0.15 ohm.	38952-14

Ref Symbol	Description	Wilcox No.
L1301	COIL, RADIO FREQUENCY: 2 turns of No. 17 AWG wire; air wound.	42251-1
L1302	COIL, RADIO FREQUENCY: 5 turns of No. 17 AWG wire; air wound.	42249-1
L1303	COIL, RADIO FREQUENCY: 2 turns of No. 17 AWG wire; air wound.	42250-1
L1801	REACTOR: 8.8 uh, ±20%; 5 amp dc; 0.02 ohm max.	38954-1
M1	AMMETER: dc; 0 to 1 ma scale; ±2% accuracy at full-scale reading; 1000 ohms per v.	35195-1
MP1901	POSITIONER, SWITCH: motor driven; incl 1 actuator bar, 1 cam, 1 gear, 1 gear case, 1 motor, 2 sensitive switches.	117438-1
P2001	CONNECTOR, PLUG: rf type; 1 round male contact; 50 ohms nom impedance.	875501
P2002	CONNECTOR, PLUG: rf type; 1 round male contact; 50 ohms nom impedance.	875501
P2003	CONNECTOR, PLUG: rf type; 1 round male contact; 50 ohms nom impedance.	288569-1

Ref Symbol	Description	Wilcox No.
P2004	CONNECTOR, PLUG: rf type; 1 round male contact; 50 ohms nom impedance.	875501
Q1001	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q1002	TRANSISTOR: silicon; NPN; Type 2N2951.	48607-1
Q1003	TRANSISTOR: silicon; NPN; Type 2N3118.	48608-1
Q1004	TRANSISTOR: silicon; NPN; Type 2N2218.	48576-1
Q1101	TRANSISTOR: silicon; NPN; Type 2N2950.	48609-1
Q1102	TRANSISTOR: silicon; NPN; Type 2N2876.	48623-1
Q1401	TRANSISTOR: silicon; NPN; Type 2N338.	48512-1
Q1402	TRANSISTOR: silicon; NPN; Type 2N338.	48512-1
Q1403	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1404	TRANSISTOR: silicon; PNP; Type 2N1132.	48565-1
Q1501	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1

Ref Symbol	Description	Wilcox No.
Q1502	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1503	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1601	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1602	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1603	TRANSISTOR: silicon; NPN; Type 2N1489.	48617-1
Q1604	TRANSISTOR: silicon; NPN; Type 2N1489.	48617-1
Q1701	TRANSISTOR: germanium; PNP; Type 2N398A.	48620-1
Q1702	TRANSISTOR: germanium; PNP; Type 2N1560.	48619-1
Q1703	TRANSISTOR: germanium; PNP; Type 2N2567.	48618-1
Q1704	TRANSISTOR: germanium; PNP; Type 2N2156.	48621-1
Q1705	TRANSISTOR: silicon; PNP; Type 2N1132.	48565-1
Q1706	TRANSISTOR: silicon; NPN; Type 2N1613.	48596-1
Q1801	TRANSISTOR: germanium; PNP; Type 2N1552.	48516-2
Q1802	TRANSISTOR: germanium; PNP; Type 2N1552.	48516-2

Ref Symbol	Description	Wilcox No.
Q1901	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1902	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q1903	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
R1001	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1002	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/4 w.	849560-1
R1003	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R1004	RESISTOR, FIXED, COMPOSITION: 560 ohms, ±5%; 1/4 w.	849551-1
R1005	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R1006	RESISTOR, FIXED, COMPOSITION: 510 ohms, ±5%; 1/4 w.	849550-1
R1007	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1008	Not assigned.	
R1009	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1010	RESISTOR, FIXED, COMPOSITION: 30,000 ohms, ±5%; 1/4 w.	849613-1
R1011	Not assigned.	
R1012	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±5%; 1/4 w.	849548-1
R1013	Not assigned.	
R1014	RESISTOR, FIXED, COMPOSITION: 820 ohms, ±5%; 1/4 w.	849558-1
R1015	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R1016	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R1017	RESISTOR, FIXED, COMPOSITION: 51 ohms, ±5%; 1/4 w.	849514-1

Ref Symbol	Description	Wilcox No.
R1101	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±5%; 1/4 w (factory selected component - typical value).	849720-1
R1201	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1 w.	851197
R1301	RESISTOR, FIXED, COMPOSITION: 3600 ohms, ±5%; 1/4 w.	849580-1
R1401	RESISTOR, VARIABLE, COMPOSITION: 5000 ohms, ±20%; 1/4 w.	54280-1
R1402	Not assigned.	
R1403	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R1404	RESISTOR, FIXED, COMPOSITION: 330,000 ohms, ±5%; 1/4 w.	849650-1
R1405	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R1406	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/4 w.	849632-1
R1407	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R1408	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/2 w.	850206
R1409	RESISTOR, FIXED, COMPOSITION: 130 ohms, ±5%; 1/4 w.	849529-1
R1410	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1

Ref Symbol	Description	Wilcox No.
R1411	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R1412	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R1413	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R1501	RESISTOR, FIXED, COMPOSITION: 75 ohms, ±5%; 1/4 w.	849520-1
R1502	RESISTOR, FIXED, COMPOSITION: 75 ohms, ±5%; 1/4 w.	849520-1
R1503	RESISTOR, FIXED, COMPOSITION: 150 ohms, ±5%; 1 w.	851167
R1504	RESISTOR, FIXED, COMPOSITION: 270 ohms, ±5%; 1 w.	851176
R1505	RESISTOR, VARIABLE, COMPOSITION: 500 ohms, ±20%; 1/4 w.	54273-1
R1506	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R1507	RESISTOR, VARIABLE, COMPOSITION: 500 ohms, ±20%; 1/4 w.	54273-1
R1508	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R1509	RESISTOR, VARIABLE, COMPOSITION: 500 ohms, ±20%; 1/4 w.	54273-1
R1510	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R1511	Not assigned.	
R1512	RESISTOR, VARIABLE, COMPOSITION: 5000 ohms, ±20%; 1/4 w.	54280-1
R1513	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R1514	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R1515	RESISTOR, FIXED, COMPOSITION: 560 ohms, ±5%; 1/4 w.	849551-1
R1516	RESISTOR, FIXED, COMPOSITION: 160 ohms, ±5%; 1/4 w.	849532-1
R1517	RESISTOR, FIXED, COMPOSITION: 6200 ohms, ±5%; 1/4 w.	849589-1
R1518	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/4 w.	849569-1

Ref Symbol	Description	Wilcox No.
R1519	RESISTOR, FIXED, COMPOSITION: 430 ohms, ±5%; 1/4 w.	849547-1
R1520	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R1521	RESISTOR, FIXED, COMPOSITION: 24,000 ohms, ±5%; 1/4 w.	849610-1
R1522	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1523	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1524	RESISTOR, FIXED, COMPOSITION: 620 ohms, ±5%; 1/4 w.	849553-1
R1525	RESISTOR, FIXED, COMPOSITION: 300 ohms, ±5%; 1/4 w.	849541-1
R1526	RESISTOR, FIXED, COMPOSITION: 24 ohms, ±5%; 1/4 w.	849734-1
R1527	RESISTOR, FIXED, COMPOSITION: 910 ohms, ±5%; 1/2 w.	850196
R1528	RESISTOR, FIXED, WIRE WOUND: 5.1 ohms, ±5%; 1/2 w.	50999-1
R1601	RESISTOR, FIXED, COMPOSITION: 300 ohms, ±5%; 1/4 w.	849541-1
R1602	RESISTOR, FIXED, WIRE WOUND: 120 ohms, ±5%; 6.5 w.	50991-1
R1603	RESISTOR, FIXED, COMPOSITION: 300 ohms, ±5%; 1/4 w.	849541-1
R1604	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±5%; 1/4 w.	849578-1
R1605	RESISTOR, FIXED, WIRE WOUND: 0.33 ohm, ±5%; 6.5 w.	50992-1
R1701	RESISTOR, FIXED, WIRE WOUND: 22 ohms, ±5%; 20 w.	50993-1
R1702	RESISTOR, FIXED, WIRE WOUND: 22 ohms, ±5%; 20 w.	50993-1
R1703	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/4 w (factory selected component - typical value).	849632-1

Ref Symbol	Description	Wilcox No.
R1704	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/2 w.	850197
R1705	RESISTOR, FIXED, COMPOSITION: 1600 ohms, ±5%; 1 w.	851205
R1706	Not assigned.	
R1707	Not assigned.	
R1708	RESISTOR, FIXED, FILM: 240 ohms, ±5%; 2 w.	50955-1
R1709	RESISTOR, FIXED, FILM: 1200 ohms, ±5%; 2 w.	50958-1
R1710	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/2 w.	850197
R1711	RESISTOR, FIXED, COMPOSITION: 1300 ohms, ±5%; 1/2 w.	850202
R1712	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/4 w (factory selected component - typical value).	849632-1
R1713	RESISTOR, FIXED, FILM: 300 ohms, ±5%; 1/2 w.	50956-1
R1714	RESISTOR, VARIABLE, COMPOSITION: 100 ohms, ±20%; 1/4 w.	54300-1
R1715	RESISTOR, FIXED, FILM: 360 ohms, ±5%; 1/2 w.	861245-1
R1716	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±5%; 1/4 w.	849720-1
R1801	RESISTOR, FIXED, COMPOSITION: 47,000 ohms, ±5%; 1/4 w.	849620-1
R1802	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±5%; 1 w.	851185
R1803	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1 w.	851208
R1804	RESISTOR, FIXED, COMPOSITION: 330 ohms, ±5%; 1/4 w.	849542-1
R1805	RESISTOR, FIXED, WIRE WOUND: 0.36 ohm, ±5%; 2 w.	50998-1
R1806	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±5%; 1/4 w.	849632-1
R1807	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1 w.	851197
R1808	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1

Ref Symbol	Description	Wilcox No.
R1809	RESISTOR, FIXED, WIRE WOUND: 5.6 ohms, ±5%; 3 w.	50997-1
R1810	RESISTOR, FIXED, WIRE WOUND: 5.6 ohms, ±5%; 3 w.	50997-1
R1811	RESISTOR, FIXED, COMPOSITION: 3.3 ohms, ±5%; 1 w.	851372-1
R1812	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±5%; 1/4 w.	849578-1
R1813	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±5%; 1 w.	851125
R1814	RESISTOR, FIXED, COMPOSITION: 1 megohm, ±5%; 1/2 w.	850306
R1815	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/4 w.	849560-1
R1816	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R1817	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R1901	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±5%; 1/4 w.	849602-1
R1902	RESISTOR, FIXED, COMPOSITION: 1200 ohms, ±5%; 1/2 w.	850200
R1903	RESISTOR, FIXED, COMPOSITION: 5600 ohms, ±5%; 1/4 w.	849587-1
R1904	RESISTOR, FIXED, COMPOSITION: 51 ohms, ±5%; 1/2 w.	850151
R1905	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±5%; 1/2 w.	850216
R1906	RESISTOR, FIXED, COMPOSITION: 20,000 ohms, ±5%; 1/4 w.	849607-1
R1907	RESISTOR, FIXED, COMPOSITION: 7500 ohms, ±5%; 1/4 w.	849592-1
S1101	SWITCH SECTION, ROTARY: 1 moving contact; 16 fixed contacts; 1 pole.	10857-1

Ref Symbol	Description	Wilcox No.
S1201	SWITCH SECTION, ROTARY: 1 moving contact; 16 fixed contacts; 1 pole.	10856-1
S1901	SWITCH SECTION, ROTARY: 2 moving contacts; 7 fixed contacts; 1 pole.	10853-1
S1902	SWITCH SECTION, ROTARY: 2 moving contacts; 24 fixed contacts; 2 poles.	10852-1
T1401	TRANSFORMER, AUDIO FREQUENCY: primary impedance 400 ohms; secondary impedance 500 ohms, center tapped; frequency response 300 to 3750 cps.	40196-1
T1501	TRANSFORMER, AUDIO FREQUENCY: primary impedance 300 ohms, center tapped; secondary impedance 600 ohms; frequency response 300 to 3750 cps.	40211-1
T1502	TRANSFORMER, AUDIO FREQUENCY: primary impedance 500 ohms, center tapped; secondary impedance 600 ohms; frequency response 300 to 3750 cps.	40212-1
T1503	TRANSFORMER, AUDIO FREQUENCY: primary impedance 300 ohms, center tapped; secondary impedance 600 ohms; frequency response 300 to 3750 cps.	40211-1
T1504	TRANSFORMER, AUDIO FREQUENCY: 1 primary; 1 secondary, center tapped; frequency response 300 to 10,000 cps.	40210-1

Ref Symbol	Description	Wilcox No.
T1601	TRANSFORMER, AUDIO FREQUENCY: modulation type; 1 primary, center tapped; three secondaries, one tapped and two untapped; frequency response 300 to 10,000 cps.	40201-1
T1801	TRANSFORMER, POWER: primary, 27.5 v center tapped; two feedback windings, 6 v each; secondary, 400 v center tapped.	43252-1
V1201	ELECTRON TUBE: tetrode; Type 8121.	8121

RECEIVER PARTS LIST

FOR

VHF TRANSCEIVER SERIES 807, TYPE 97607

Ref Symbol	Description	Wilcox No.
C101	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C102	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C103	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C104	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C105	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C106	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C107	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C108	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C109	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C110	CAPACITOR, FIXED, MICA: 82 uuf, ±5%; 100 vdcw.	17429-2
C111	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C112	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C113	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 80 vdcw.	19407-2
C114	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 80 vdcw.	19407-2
C115	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C116	CAPACITOR, FIXED, MICA: 56 uuf, ±5%; 100 vdcw.	17449-2
C117	CAPACITOR, FIXED, PLASTIC: 1800 uuf, ±5%; 80 vdcw.	19411-2
C118	CAPACITOR, FIXED, CERAMIC: 2000 uuf, ±20%; 200 vdcw.	23221-1
C119	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 80 vdcw.	19407-2
C120	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C121	CAPACITOR, FIXED, MICA: 470 uuf, ±5%; 100 vdcw.	17442-2
C122	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C123	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C124	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3

Ref Symbol	Description	Wilcox No.
C125	CAPACITOR, FIXED, MICA: 470 uuf, ±5%; 100 vdcw.	17442-2
C126	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C127	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C128	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C129	CAPACITOR, FIXED, MICA: 330 uuf, ±5%; 100 vdcw.	17450-2
C130	CAPACITOR, FIXED, MICA: 180 uuf, ±5%; 100 vdcw.	17372-2
C131	CAPACITOR, FIXED, MICA: 560 uuf, ±5%; 100 vdcw.	17415-2
C132	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C133	Not assigned.	
C134	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C135	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C136	CAPACITOR, FIXED, MICA: 470 uuf, ±5%; 100 vdcw.	17442-2
C137	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C138	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C139	Not assigned.	
C140	CAPACITOR, FIXED, MICA: 120 uuf, ±5%; 100 vdcw.	17448-2
C141	CAPACITOR, FIXED, MICA: 330 uuf, ±5%; 100 vdcw.	17450-2
C142	CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw.	19407-1
C143	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C144	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C145	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C146	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17421-3
C147	CAPACITOR, FIXED, MICA: 240 uuf, ±2%; 100 vdcw.	17414-3
C148	CAPACITOR, FIXED, MICA: 8 uuf, ±0.5 uuf; 100 vdcw.	17456-1

Ref Symbol	Description	Wilcox No.
C201	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C202	Not assigned.	
C203	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C204	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C205	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C206	CAPACITOR, FIXED, PLASTIC: 0.047 uf, ±20%; 80 vdcw.	19407-5
C207	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C208	CAPACITOR, FIXED, MICA: 5000 uuf, ±5%; 100 vdcw.	17435-2
C209	CAPACITOR, FIXED, PLASTIC: 0.047 uf, ±20%; 80 vdcw.	19407-5
C210	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C211	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C212	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C213	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C214	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C215	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C216	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±20%; 35 vdcw.	21122-1
C217	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C218	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 2.2 uf, ±20%; 35 vdcw.	21161-1
C219	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C220	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1

Ref Symbol	Description	Wilcox No.
C221	CAPACITOR, FIXED, PLASTIC: 0.1 uf, ±20%; 50 vdcw.	19279-1
C301	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±10%; 15 vdcw.	21261-2
C302	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 1 uf, ±10%; 35 vdcw.	21183-1
C303	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C304	CAPACITOR, FIXED, PLASTIC: 0.068 uf, ±10%; 50 vdcw.	19383-2
C305	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 27 uf, ±10%; 10 vdcw.	21262-2
C306	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C307	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 47 uf, ±10%; 15 vdcw.	21261-2
C401	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C402	CAPACITOR, FIXED, MICA: 24 uuf, ±5%; 100 vdcw.	17370-2
C403	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C404	CAPACITOR, FIXED, MICA: 6 uuf, ±0.5 uuf; 100 vdcw.	17411-2
C405	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C406	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C407	CAPACITOR, FIXED, MICA: 32 uuf, ±5%; 100 vdcw.	17413-2
C408	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1

Ref Symbol	Description	Wilcox No.
C409	CAPACITOR, FIXED, MICA: 10 uuf, ±5%; 100 vdcw.	17412-2
C410	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C501	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C502	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C503	CAPACITOR, FIXED, MICA: 30 uuf, ±2%; 100 vdcw.	17457-3
C504	CAPACITOR, FIXED, MICA: 560 uuf, ±5%; 100 vdcw.	17415-2
C505	CAPACITOR, FIXED, MICA: 390 uuf, ±5%; 100 vdcw.	17368-2
C506	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C601	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C602	CAPACITOR, FIXED, MICA: 220 uuf, ±5%; 100 vdcw.	17451-2
C603	CAPACITOR, FIXED, MICA: 750 uuf, ±5%; 100 vdcw.	17379-2
C604	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C605	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C606	CAPACITOR, FIXED, MICA: 120 uuf, ±5%; 100 vdcw.	17448-2
C607	CAPACITOR, FIXED, MICA: 390 uuf, ±5%; 100 vdcw.	17368-2
C608	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C609	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C610	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3

Ref Symbol	Description	Wilcox No.
C611	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C612	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C613	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C614	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C615	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C616	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C617	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C618	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C619	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C620	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C621	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C623	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C624	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C625	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C626	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C627	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C628	CAPACITOR, FIXED, MICA: 56 uuf, ±2%; 100 vdcw.	17449-3
C701	CAPACITOR, FIXED, MICA: 51 uuf, ±5%; 100 vdcw.	17378-2
C702	CAPACITOR, FIXED, MICA: 270 uuf, ±5%; 100 vdcw.	17452-2
C703	CAPACITOR, FIXED, MICA: 1000 uuf, ±5%; 100 vdcw.	17419-2
C704	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2

Ref Symbol	Description	Wilcox No.
C705	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C706	CAPACITOR, FIXED, MICA: 560 uuf, ±5%; 100 vdcw.	17415-2
C707	CAPACITOR, FIXED, CERAMIC: 1000 uuf, ±10%; 500 vdcw.	23271-1
C708	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C709	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C710	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C711	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C712	CAPACITOR, FIXED, MICA: 36 uuf, ±2%; 100 vdcw.	17366-3
C713	CAPACITOR, FIXED, MICA: 39 uuf, ±2%; 100 vdcw.	17367-3
C714	CAPACITOR, FIXED, MICA: 39 uuf, ±2%; 100 vdcw.	17367-3
C715	CAPACITOR, FIXED, MICA: 39 uuf, ±2%; 100 vdcw.	17367-3
C716	CAPACITOR, FIXED, MICA: 39 uuf, ±2%; 100 vdcw.	17367-3
C801	CAPACITOR, FIXED, CERAMIC: 0.01 uf, ±10%; 75 vdcw.	23270-2
C802	CAPACITOR, FIXED, CERAMIC: 2000 uuf, ±20%; 200 vdcw.	23221-1
C803	CAPACITOR, FIXED, MICA: 750 uuf, ±5%; 100 vdcw.	17379-2
C804	CAPACITOR, FIXED, MICA: 43 uuf, ±5%; 100 vdcw.	17432-2
C901	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 6.8 uf, ±10%; 35 vdcw.	21266-1
C902	CAPACITOR, FIXED, PLASTIC: 0.022 uf, ±10%; 80 vdcw.	19408-1

Ref Symbol	Description	Wilcox No.
C903	CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 3.3 uf, ±20%; 75 vdcw.	21272-1
CR101	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR102	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR103	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR201	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR202	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR203	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR204	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR205	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR301	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR302	SEMICONDUCTOR DEVICE, DIODE: germanium; tunnel Type 1N3712.	46229-1
CR303	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR304	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N816.	46153-1
CR305	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1
CR306	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N627.	46104-1

Ref Symbol	Description	Wilcox No.
CR401	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR402	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR403	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR404	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR405	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR406	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR407	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR408	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR409	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR410	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR411	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR412	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR413	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR414	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR415	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR416	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR417	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR418	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR419	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR420	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1

Ref Symbol	Description	Wilcox No.
CR501	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR502	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR503	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR601	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR602	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR603	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR604	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR605	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR606	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR607	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR608	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR609	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR610	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR611	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR612	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR613	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR614	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR615	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR616	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR617	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1

Ref Symbol	Description	Wilcox No.
CR618	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR619	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR620	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR701	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR702	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR703	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR704	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR705	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR706	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR707	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR708	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR901	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR902	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR903	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR904	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR905	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR906	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR907	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1

Ref Symbol	Description	Wilcox No.
CR908	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR909	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR910	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR911	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR912	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR913	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR914	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR915	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR916	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR917	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR918	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR919	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR920	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR921	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR922	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR923	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR924	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR925	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR926	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR927	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR928	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR929	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR930	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR931	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1

Ref Symbol	Description	Wilcox No.
CR932	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR933	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR934	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR935	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR936	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR937	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR938	SEMICONDUCTOR DEVICE, DIODE: germanium; Type 1N270.	46122-1
CR939	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR940	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR941	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR942	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR943	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR944	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR945	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR946	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR947	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR948	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR949	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR950	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR951	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR952	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1
CR953	SEMICONDUCTOR DEVICE, DIODE: silicon; Type 1N676.	46204-1

Ref Symbol	Description	Wilcox No.
FL1	FILTER, LOW PASS: feed-through type.	23254-2
FL2	FILTER, LOW PASS: feed-through type.	23254-2
FL3	FILTER, LOW PASS: feed-through type.	23254-2
FL4	FILTER, LOW PASS: feed-through type.	23254-2
FL5	FILTER, LOW PASS: feed-through type.	23254-2
FL6	FILTER, LOW PASS: feed-through type.	23254-2
FL7	FILTER, LOW PASS: feed-through type.	23254-2
FL8	FILTER, LOW PASS: feed-through type.	23254-2
FL9	FILTER, LOW PASS: feed-through type.	23254-2
FL10	FILTER, LOW PASS: feed-through type.	23254-2
FL11	FILTER, LOW PASS: feed-through type.	23254-2
FL12	FILTER, LOW PASS: feed-through type.	23254-2
FL13	FILTER, LOW PASS: feed-through type.	23254-2
FL14	FILTER, LOW PASS: feed-through type.	23254-2
FL15	FILTER, LOW PASS: feed-through type.	23254-2
FL16	FILTER, LOW PASS: feed-through type.	23254-2
FL17	FILTER, LOW PASS: feed-through type.	23254-2
FL18	FILTER, LOW PASS: feed-through type.	23254-2
FL19	FILTER, LOW PASS: feed-through type.	23254-2
FL20	FILTER, LOW PASS: feed-through type.	23254-2
FL21	FILTER, LOW PASS: feed-through type.	23254-2
FL22	FILTER, LOW PASS: feed-through type.	23254-2
FL23	FILTER, LOW PASS: feed-through type.	23254-2
FL24	FILTER, LOW PASS: feed-through type.	23254-2

Ref Symbol	Description	Wilcox No.
FL25	FILTER, LOW PASS: feed-through type.	23254-2
FL26	FILTER, LOW PASS: feed-through type.	23254-2
FL27	FILTER, LOW PASS: feed-through type.	23254-2
FL101	FILTER, BAND PASS: 115 to 151 mc bandwidth; input impedance 50 ohms; output impedance 80 ohms; varactor tuned.	44275-1
FL102	FILTER, BAND PASS: 115.3 to 150.7 mc bandwidth; input impedance 1000 ohms; output impedance 80 ohms; varactor tuned.	44276-1
FL103	FILTER, BAND PASS: 15.1 to 16.075 mc bandwidth; input impedance 3000 ohms; output impedance 500 ohms.	44272-1
FL104	FILTER, BAND PASS: 3.45 to 3.55 mc bandwidth; input impedance 6000 ohms; output impedance 300 ohms.	44271-2
FL105	FILTER, BAND PASS: 415 to 495 kc bandwidth; input impedance 6000 ohms; output impedance 1200 ohms.	44273-1
FL106	FILTER, BAND PASS: piezoelectric ladder-type ceramic unit; 435 to 475 kc bandwidth. (For 'normal' receiver selectivity only.)	44266-1
or		
FL106	FILTER, BAND PASS: piezoelectric ladder-type ceramic unit; 445 to 465 kc bandwidth. (For 'sharp' receiver selectivity only.)	44266-2
FL107	FILTER, BAND PASS: 104.9 to 123.9 mc bandwidth; input impedance 1000 ohms; output impedance 100 ohms.	44268-2
FL108	FILTER, BAND PASS: 99.7 to 135.1 mc bandwidth; input impedance 1000 ohms; output impedance 80 ohms; varactor tuned.	44277-1
FL109	FILTER, BAND PASS: 99.7 to 135.1 mc bandwidth; input impedance 1000 ohms; output impedance 80 ohms; varactor tuned.	44277-2

Ref Symbol	Description	Wilcox No.
FL110	FILTER, BAND PASS: 18.6 to 19.575 mc bandwidth; input impedance 3000 ohms; output impedance 300 ohms.	44267-1
FL111	FILTER, BAND PASS: 15.1 to 16.075 mc bandwidth; input impedance 3000 ohms; output impedance 500 ohms.	44270-1
FL112	FILTER, BAND PASS: 115.3 to 150.7 mc bandwidth; input impedance 1000 ohms; output impedance 80 ohms; varactor tuned.	44278-1
FL301	FILTER, BAND PASS: 300 to 3750 cps bandwidth; input impedance 4000 ohms; output impedance 4000 ohms. (For use with 'normal' selectivity filter FL106 only.)	38179-1
or		
FL301	FILTER, BAND PASS: 300 to 2300 cps bandwidth; input impedance 4000 ohms; output impedance 4000 ohms. (For use with 'sharp' selectivity filter FL106 only.)	38179-2
J3	JACK, TELEPHONE: one spring leaf contact.	29558
L101	Not assigned.	
L102	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L103	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13
L104	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13

Ref Symbol	Description	Wilcox No.
L105	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13
L106	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L107	CHOKE, RADIO FREQUENCY: 68 uh ±10% at 2.5 mc; 240 ma dc; 2.5 ohms.	38952-3
L108	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L109	Not assigned.	
L110	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L111	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L112	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L113	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L114	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L115	Not assigned.	
L116	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L117	CHOKE, RADIO FREQUENCY: 27 uh ±10% at 2.5 mc; 360 ma dc; 1.1 ohms.	38952-17
L118	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13
L119	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L120	CHOKE, RADIO FREQUENCY: 2.7 uh ±10% at 7.9 mc; 800 ma dc; 0.15 ohm.	38952-14
L121	CHOKE, RADIO FREQUENCY: 1.2 uh ±10% at 7.9 mc; 1.34 amp dc; 0.08 ohm.	38952-18

Ref Symbol	Description	Wilcox No.
L122	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L123	CHOKE, RADIO FREQUENCY: 68 uh ±10% at 2.5 mc; 240 ma dc; 2.5 ohms.	38952-3
L124	CHOKE, RADIO FREQUENCY: 1.2 uh ±10% at 7.9 mc; 1.34 amp dc; 0.08 ohm.	38952-18
L125	CHOKE, RADIO FREQUENCY: 3.3 uh ±10% at 7.9 mc; 730 ma dc; 0.27 ohm.	38952-15
L201	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L202	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L203	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L204	CHOKE, RADIO FREQUENCY: 22 mh ±10% at 79 kc; 290 ma dc; 170 ohms.	38952-10
L205	CHOKE, RADIO FREQUENCY: 22 mh ±10% at 79 kc; 290 ma dc; 170 ohms.	38952-10
L206	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
L207	CHOKE, RADIO FREQUENCY: 10 mh ±10% at 250 kc; 38 ma dc; 137 ohms.	38952-9
L401	COIL, RADIO FREQUENCY: 12-1/2 turns of No. 26 AWG wire on nylon coil form; slug tuned.	38962-1
L402	COIL, RADIO FREQUENCY: 13-1/2 turns of No. 26 AWG wire on nylon coil form; slug tuned.	38963-1

Ref Symbol	Description	Wilcox No.
L403	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L404	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L405	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L406	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L407	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L408	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L409	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L410	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L411	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L412	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L413	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L414	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L415	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L416	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L417	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L418	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L419	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5

Ref Symbol	Description	Wilcox No.
L420	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L421	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L422	CHOKE, RADIO FREQUENCY: 6.8 uh ±10% at 7.9 mc; 450 ma dc; 0.7 ohm.	38952-5
L501	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13
L502	CHOKE, RADIO FREQUENCY: 100 uh ±10% at 2.5 mc; 200 ma dc; 2.2 ohms.	38952-13
L601	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L602	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L603	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L604	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L605	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L606	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L607	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L608	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7

Ref Symbol	Description	Wilcox No.
L609	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L610	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L611	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L612	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L613	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L614	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L615	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L616	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L617	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L618	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L619	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L620	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L701	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L702	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L703	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7

Ref Symbol	Description	Wilcox No.
L704	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L705	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L706	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L707	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L708	CHOKE, RADIO FREQUENCY: 470 uh ±10% at 790 kc; 180 ma dc; 6 ohms.	38952-7
L901	CHOKE, RADIO FREQUENCY: 1 mh ±10% at 790 kc; 100 ma dc; 13 ohms.	38952-8
Q101	TRANSISTOR: germanium; PNP; Type 2N3282.	48626-1
Q102	TRANSISTOR: germanium; PNP; Type 2N3282.	48626-1
Q103	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q104	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q105	TRANSISTOR: germanium; PNP; Type 2N3282.	48626-1
Q106	TRANSISTOR: germanium; PNP; Type 2N3282.	48626-1
Q107	TRANSISTOR: germanium; PNP; Type 2N2398.	48598-1
Q108	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q109	TRANSISTOR: germanium; PNP; Type 2N2398.	48598-1
Q110	TRANSISTOR: germanium; PNP; Type 2N2398.	48598-1

Ref Symbol	Description	Wilcox No.
Q201	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q202	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q203	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q204	TRANSISTOR: silicon; PNP; Type 2N1132.	48565-1
Q205	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q301	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q302	TRANSISTOR: germanium; PNP; Type 2N1143.	48536-1
Q303	TRANSISTOR: silicon; NPN; Type 2N338.	48512-1
Q304	TRANSISTOR: silicon; NPN; Type 2N338.	48512-1
Q305	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q306	TRANSISTOR: silicon; PNP; Type 2N1132.	48565-1
Q401	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q402	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1

Ref Symbol	Description	Wilcox No.
Q501	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q601	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q602	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q701	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q702	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q801	TRANSISTOR: germanium; PNP; Type 2N1195.	48595-1
Q901	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q902	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q903	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q904	TRANSISTOR: silicon; NPN; Type 2N697.	48513-1
Q905	TRANSISTOR: silicon; NPN; Type 2N698.	48624-1

Ref Symbol	Description	Wilcox No.
R101	RESISTOR, FIXED, COMPOSITION: 5100 ohms, ±5%; 1/4 w.	849586-1
R102	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R103	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R104	RESISTOR, FIXED, COMPOSITION: 390 ohms, ±5%; 1/4 w.	849545-1
R105	RESISTOR, FIXED, COMPOSITION: 3600 ohms, ±5%; 1/4 w.	849580-1
R106	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R107	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R108	RESISTOR, FIXED, COMPOSITION: 6800 ohms, ±5%; 1/4 w.	849590-1
R109	RESISTOR, FIXED, COMPOSITION: 390 ohms, ±5%; 1/4 w.	849545-1
R110	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/4 w.	849569-1
R111	RESISTOR, FIXED, COMPOSITION: 3600 ohms, ±5%; 1/4 w.	849580-1
R112	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R113	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R114	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R115	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R116	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R117	RESISTOR, FIXED, COMPOSITION: 5100 ohms, ±5%; 1/4 w.	849586-1
R118	RESISTOR, FIXED, COMPOSITION: 5100 ohms, ±5%; 1/4 w.	849586-1
R119	RESISTOR, FIXED, COMPOSITION: 62 ohms, ±5%; 1/4 w.	849517-1
R120	RESISTOR, FIXED, COMPOSITION: 16,000 ohms, ±5%; 1/4 w.	849604-1
R121	RESISTOR, FIXED, COMPOSITION: 6800 ohms, ±5%; 1/4 w.	849590-1
R122	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R123	RESISTOR, FIXED, COMPOSITION: 12,000 ohms, ±5%; 1/4 w.	849599-1
R124	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1

Ref Symbol	Description	Wilcox No.
R125	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R126	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R127	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R128	Not assigned.	
R129	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R130	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R131	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R132	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R133	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R134	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R135	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±5%; 1/4 w.	849554-1
R136	RESISTOR, FIXED, COMPOSITION: 200 ohms, ±5%; 1/4 w.	849535-1
R137	RESISTOR, FIXED, COMPOSITION: 62 ohms, ±5%; 1/4 w.	849517-1
R138	RESISTOR, FIXED, COMPOSITION: 33 ohms, ±5%; 1/4 w.	849738-1
R139	RESISTOR, FIXED, COMPOSITION: 62 ohms, ±5%; 1/4 w.	849517-1
R140	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R141	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R142	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R143	RESISTOR, FIXED, COMPOSITION: 510 ohms, ±5%; 1/4 w.	849550-1
R144	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R145	Not assigned.	
R146	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R147	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R148	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R149	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±5%; 1/4 w.	849548-1

Ref Symbol	Description	Wilcox No.
R150	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R151	RESISTOR, FIXED, COMPOSITION: 27,000 ohms, ±5%; 1/4 w.	849611-1
R152	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R201	RESISTOR, VARIABLE, COMPOSITION: 1000 ohms, ±20%; 1/4 w.	54319-1
R202	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R203	RESISTOR, FIXED, COMPOSITION: 390 ohms, ±5%; 1/4 w.	849545-1
R204	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R205	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R206	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R207	RESISTOR, FIXED, COMPOSITION: 820 ohms, ±5%; 1/4 w.	849558-1
R208	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R209	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R210	RESISTOR, FIXED, COMPOSITION: 8200 ohms, ±5%; 1/4 w.	849593-1
R211	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R212	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R213	RESISTOR, FIXED, COMPOSITION: 12,000 ohms, ±5%; 1/4 w.	849599-1
R214	RESISTOR, FIXED, COMPOSITION: 620 ohms, ±5%; 1/4 w.	849553-1
R215	RESISTOR, FIXED, COMPOSITION: 560 ohms, ±5%; 1/4 w.	849551-1
R216	RESISTOR, FIXED, COMPOSITION: 820 ohms, ±5%; 1/4 w.	849558-1
R217	RESISTOR, FIXED, COMPOSITION: 5100 ohms, ±5%; 1/4 w.	849586-1
R218	RESISTOR, FIXED, COMPOSITION: 20,000 ohms, ±5%; 1/4 w.	849607-1
R219	RESISTOR, FIXED, COMPOSITION: 220 ohms, ±5%; 1/4 w.	849536-1

Ref Symbol	Description	Wilcox No.
R220	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±5%; 1/4 w.	849578-1
R221	RESISTOR, FIXED, COMPOSITION: 8200 ohms, ±5%; 1/4 w.	849593-1
R222	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R223	RESISTOR, FIXED, COMPOSITION: 6800 ohms, ±5%; 1/4 w.	849590-1
R224	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±5%; 1/4 w.	849554-1
R225	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±5%; 1/4 w.	849578-1
R226	RESISTOR, FIXED, COMPOSITION: 20,000 ohms, ±5%; 1/4 w.	849607-1
R227	RESISTOR, FIXED, COMPOSITION: 82 ohms, ±5%; 1/4 w.	849521-1
R228	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±5%; 1/4 w.	849602-1
R229	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±5%; 1/4 w.	849554-1
R230	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R231	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R301	RESISTOR, VARIABLE, COMPOSITION: 500 ohms, ±10%; 1/4 w.	54331-1
R302	RESISTOR, FIXED, COMPOSITION: 300 ohms, ±5%; 1/4 w.	849541-1
R303	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R304	RESISTOR, FIXED, COMPOSITION: 5100 ohms, ±5%; 1/4 w.	849586-1
R305	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±5%; 1/4 w.	849581-1
R306	RESISTOR, FIXED, COMPOSITION: 8200 ohms, ±5%; 1/4 w.	849593-1
R307	RESISTOR, FIXED, COMPOSITION: 300,000 ohms, ±5%; 1/4 w.	849649-1
R308	RESISTOR, VARIABLE, COMPOSITION: 4000 ohms, ±10%; 1/4 w.	54330-1
R309	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R310	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±10%; 1/4 w.	849632-1

Ref Symbol	Description	Wilcox No.
R311	RESISTOR, FIXED, COMPOSITION: 130 ohms, ±5%; 1/4 w.	849529-1
R312	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/2 w.	850206
R313	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R314	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R315	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R316	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±5%; 1/4 w.	849572-1
R317	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R401	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R402	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R403	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/4 w.	849560-1
R404	RESISTOR, FIXED, COMPOSITION: 160,000 ohms, ±5%; 1/4 w.	849640-1
R405	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R406	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/4 w.	849569-1
R407	RESISTOR, FIXED, COMPOSITION: 3000 ohms, ±5%; 1/4 w.	849577-1
R408	RESISTOR, FIXED, COMPOSITION: 100 ohms, ±5%; 1/4 w.	849524-1
R409	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1/4 w.	849560-1
R410	RESISTOR, FIXED, COMPOSITION: 160,000 ohms, ±5%; 1/4 w.	849640-1
R411	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R412	RESISTOR, FIXED, COMPOSITION: 1800 ohms, ±5%; 1/4 w.	849569-1
R413	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R414	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R415	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1

Ref Symbol	Description	Wilcox No.
R416	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R417	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R418	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R419	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R420	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R421	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R422	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R423	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R424	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R425	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R426	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R427	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R428	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R429	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R430	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R431	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R432	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R433	Not assigned.	
R434	RESISTOR, FIXED, COMPOSITION: 200 ohms, ±5%; 1/4 w.	849535-1
R435	RESISTOR, FIXED, COMPOSITION: 200 ohms, ±5%; 1/4 w.	849535-1
R501	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1
R502	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±5%; 1/4 w.	849584-1

Ref Symbol	Description	Wilcox No.
R503	RESISTOR, FIXED, COMPOSITION: 2400 ohms, ±5%; 1/4 w.	849574-1
R504	RESISTOR, FIXED, COMPOSITION: 2400 ohms, ±5%; 1/4 w.	849574-1
R505	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R506	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R507	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R508	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R509	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R510	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R601	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R602	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R603	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R604	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R605	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R606	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R607	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R608	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R609	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R610	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R611	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R612	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R613	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R614	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1

Ref Symbol	Description	Wilcox No.
R615	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R616	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R617	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R618	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R619	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R620	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R621	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R622	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R623	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R624	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R625	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R626	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R627	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R628	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R701	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R702	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R703	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R704	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R705	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/4 w.	849571-1
R706	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R707	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R708	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1

Ref Symbol	Description	Wilcox No.
R709	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R710	RESISTOR, FIXED, COMPOSITION: 750 ohms, ±5%; 1/4 w.	849556-1
R711	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R712	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R713	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R714	RESISTOR, FIXED, COMPOSITION: 1500 ohms, ±5%; 1/4 w.	849566-1
R801	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±5%; 1/4 w.	849602-1
R802	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R803	RESISTOR, FIXED, COMPOSITION: 82,000 ohms, ±5%; 1/4 w.	849629-1
R901	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1 w.	851197
R902	RESISTOR, FIXED, COMPOSITION: 20,000 ohms, ±5%; 1/4 w.	849607-1
R903	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1 w.	851197
R904	RESISTOR, FIXED, COMPOSITION: 20,000 ohms, ±5%; 1/4 w.	849607-1
R905	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±5%; 1 w.	851197
R906	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±5%; 1/4 w.	849596-1
R907	RESISTOR, FIXED, FILM: 4020 ohms, ±1%; 1/8 w.	853528-1
R908	RESISTOR, FIXED, FILM: 750 ohms, ±1%; 1/8 w.	853532-1
R909	RESISTOR, FIXED, FILM: 37,900 ohms, ±1%; 1/8 w.	853527-1
R910	RESISTOR, FIXED, FILM: 7410 ohms, ±1%; 1/8 w.	853526-1

Ref Symbol	Description	Wilcox No.
R911	RESISTOR, FIXED, FILM: 4700 ohms, ±1%; 1/8 w.	853535-1
R912	RESISTOR, FIXED, FILM: 249,000 ohms, ±1%; 1/8 w.	853541-1
R913	RESISTOR, FIXED, FILM: 61,900 ohms, ±1%; 1/8 w.	853539-1
R914	RESISTOR, FIXED, FILM: 21,000 ohms, ±1%; 1/8 w.	853524-1
R915	RESISTOR, FIXED, FILM: 7410 ohms, ±1%; 1/8 w.	853526-1
R916	RESISTOR, FIXED, FILM: 7870 ohms, ±1%; 1/8 w.	853525-1
R917	RESISTOR, FIXED, COMPOSITION: 13,000 ohms, ±5%; 1/4 w.	849601-1
R918	RESISTOR, FIXED, FILM: 54,200 ohms, ±1%; 1/8 w.	853533-1
R919	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±5%; 1/4 w.	849554-1
R920	RESISTOR, FIXED, FILM: 22,900 ohms, ±1%; 1/8 w.	853529-1
R921	RESISTOR, FIXED, FILM: 16,500 ohms, ±1%; 1/8 w.	853521-1
R922	RESISTOR, FIXED, FILM: 19,800 ohms, ±1%; 1/8 w.	853520-1
R923	RESISTOR, FIXED, FILM: 24,900 ohms, ±1%; 1/8 w.	853530-1
R924	RESISTOR, FIXED, FILM: 31,200 ohms, ±1%; 1/8 w.	853534-1
R925	RESISTOR, FIXED, FILM: 39,700 ohms, ±1%; 1/8 w.	853523-1
R926	RESISTOR, FIXED, FILM: 51,700 ohms, ±1%; 1/8 w.	853536-1
R927	RESISTOR, FIXED, FILM: 74,100 ohms, ±1%; 1/8 w.	853519-1
R928	RESISTOR, FIXED, FILM: 114,000 ohms, ±1%; 1/8 w.	853531-1
R929	RESISTOR, FIXED, FILM: 261,000 ohms, ±1%; 1/8 w.	853538-1
R930	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R931	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±5%; 1/4 w.	849575-1
R932	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/2 w.	850208
R933	RESISTOR, FIXED, COMPOSITION: 2000 ohms, ±5%; 1/2 w.	850208
R934	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R935	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1

Ref Symbol	Description	Wilcox No.
R936	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R937	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R938	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R939	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R940	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R941	RESISTOR, FIXED, WIRE WOUND: 390 ohms, ±3%; 3 w.	50994-1
R942	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R943	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R944	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
R945	RESISTOR, FIXED, WIRE WOUND: 390 ohms, ±3%; 3 w.	50994-1
R946	RESISTOR, FIXED, WIRE WOUND: 560 ohms, ±5%; 3 w.	50995-1
T301	TRANSFORMER, AUDIO FREQUENCY: primary impedance 500 ohms; secondary impedance 100 ohms; frequency response 300 to 22,000 cps.	40207-1
T302	TRANSFORMER, AUDIO FREQUENCY: primary impedance 400 ohms; secondary impedance 500 ohms, center tapped; frequency response 300 to 3750 cps.	40196-1
T901	TRANSFORMER, POWER: primary, 20 v; one feedback winding; secondary, 50 v.	40209-1

Ref Symbol	Description	Wilcox No.
Y401	CRYSTAL UNIT, QUARTZ: 57.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y402	CRYSTAL UNIT, QUARTZ: 58.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y403	CRYSTAL UNIT, QUARTZ: 59.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y404	CRYSTAL UNIT, QUARTZ: 60.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y405	CRYSTAL UNIT, QUARTZ: 61.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y406	CRYSTAL UNIT, QUARTZ: 58.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y407	CRYSTAL UNIT, QUARTZ: 60.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y408	CRYSTAL UNIT, QUARTZ: 57.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y409	CRYSTAL UNIT, QUARTZ: 59.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y410	CRYSTAL UNIT, QUARTZ: 61.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y411	CRYSTAL UNIT, QUARTZ: 52.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y412	CRYSTAL UNIT, QUARTZ: 53.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y413	CRYSTAL UNIT, QUARTZ: 54.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y414	CRYSTAL UNIT, QUARTZ: 55.95 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y415	CRYSTAL UNIT, QUARTZ: 56.95 mc operating frequency; plug-in type. (Specify frequency.)	
Y416	CRYSTAL UNIT, QUARTZ: 53.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3

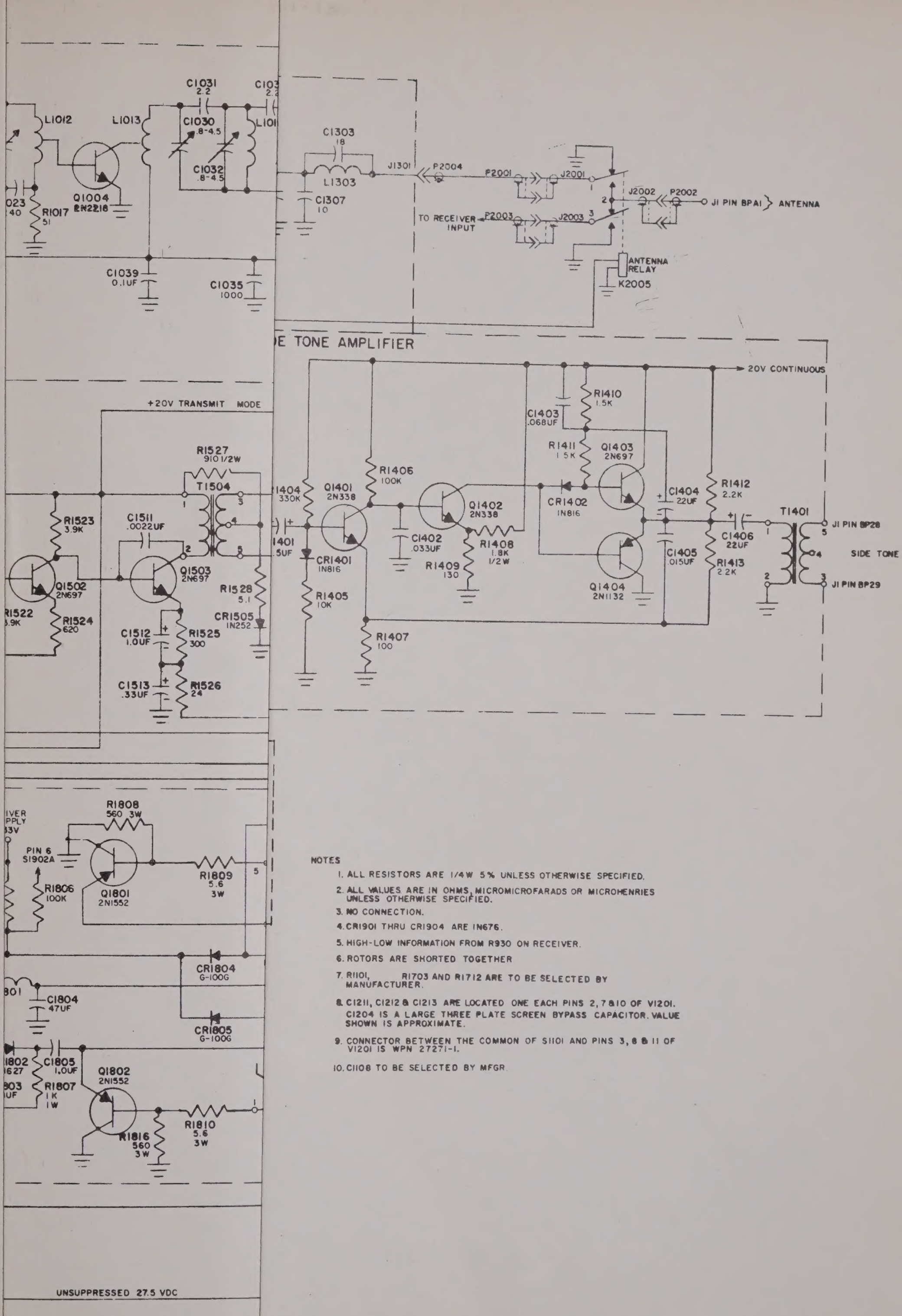
Ref Symbol	Description	Wilcox No.
Y417	CRYSTAL UNIT, QUARTZ: 55.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y418	CRYSTAL UNIT, QUARTZ: 52.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y419	CRYSTAL UNIT, QUARTZ: 54.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y420	CRYSTAL UNIT, QUARTZ: 56.45 mc operating frequency; plug-in type. (Specify frequency.)	247297-3
Y501	CRYSTAL UNIT, QUARTZ: 10.0 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y502	CRYSTAL UNIT, QUARTZ: 9.999 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y601	CRYSTAL UNIT, QUARTZ: 10.201 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y602	CRYSTAL UNIT, QUARTZ: 10.401 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y603	CRYSTAL UNIT, QUARTZ: 10.601 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y604	CRYSTAL UNIT, QUARTZ: 10.801 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y605	CRYSTAL UNIT, QUARTZ: 11.001 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y606	CRYSTAL UNIT, QUARTZ: 10.301 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y607	CRYSTAL UNIT, QUARTZ: 10.701 mc operating frequency; plug-in type. (Specify frequency.)	247295-6

Ref Symbol	Description	Wilcox No.
Y608	CRYSTAL UNIT, QUARTZ: 10.101 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y609	CRYSTAL UNIT, QUARTZ: 10.501 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y610	CRYSTAL UNIT, QUARTZ: 10.901 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y611	CRYSTAL UNIT, QUARTZ: 19.8 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y612	CRYSTAL UNIT, QUARTZ: 20.0 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y613	CRYSTAL UNIT, QUARTZ: 20.2 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y614	CRYSTAL UNIT, QUARTZ: 20.4 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y615	CRYSTAL UNIT, QUARTZ: 20.6 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y616	CRYSTAL UNIT, QUARTZ: 19.9 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y617	CRYSTAL UNIT, QUARTZ: 20.3 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y618	CRYSTAL UNIT, QUARTZ: 19.7 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y619	CRYSTAL UNIT, QUARTZ: 20.1 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y620	CRYSTAL UNIT, QUARTZ: 20.5 mc operating frequency; plug-in type. (Specify frequency.)	247295-7
Y701	CRYSTAL UNIT, QUARTZ: 8.524 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y702	CRYSTAL UNIT, QUARTZ: 8.499 mc operating frequency; plug-in type. (Specify frequency.)	247295-6

Ref Symbol	Description	Wilcox No.
Y703	CRYSTAL UNIT, QUARTZ: 8.549 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y704	CRYSTAL UNIT, QUARTZ: 8.574 mc operating frequency; plug-in type. (Specify frequency.)	247295-6
Y705	CRYSTAL UNIT, QUARTZ: 4.575 mc operating frequency; plug-in type. (Specify frequency.)	247299-3
Y706	CRYSTAL UNIT, QUARTZ: 4.6 mc operating frequency; plug-in type. (Specify frequency.)	247299-3
Y707	CRYSTAL UNIT, QUARTZ: 4.55 mc operating frequency; plug-in type. (Specify frequency.)	247299-3
Y708	CRYSTAL UNIT, QUARTZ: 4.525 mc operating frequency; plug-in type. (Specify frequency.)	247299-3
Y801	CRYSTAL UNIT, QUARTZ: 3.045 mc operating frequency; plug-in type. (Specify frequency.)	247298-4

SECTION VII

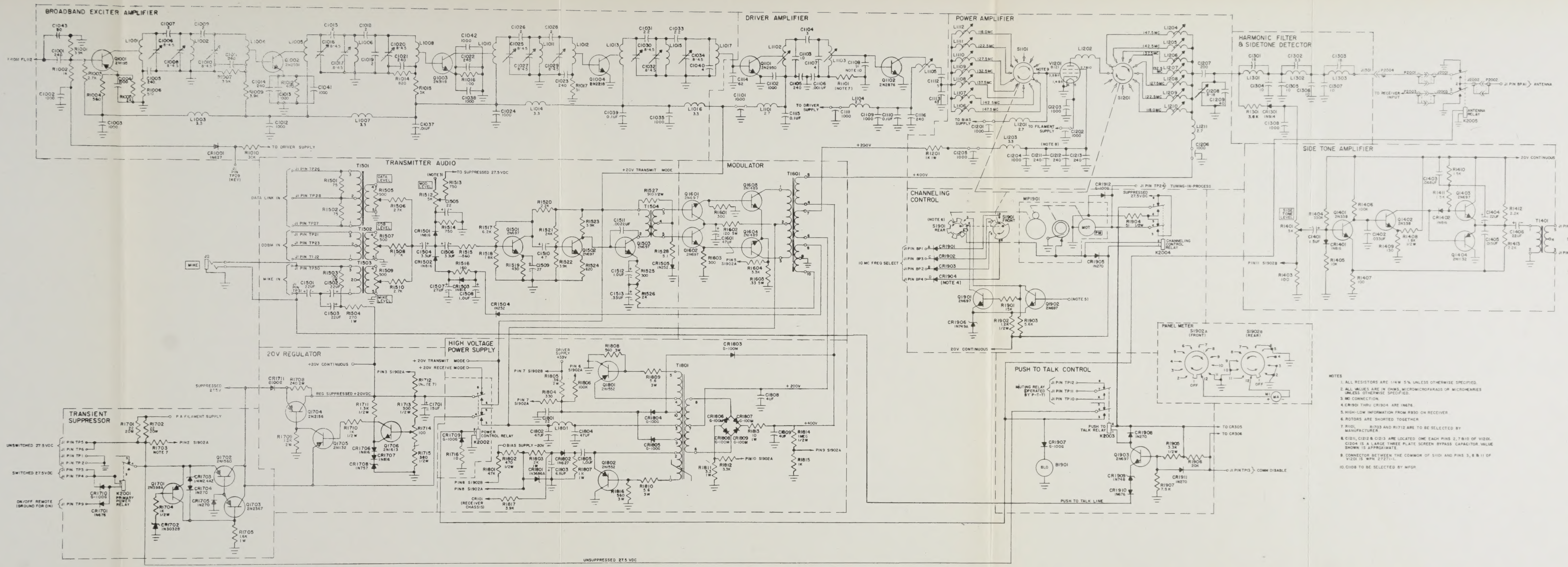
SCHEMATIC DIAGRAMS


C1031
2.2
L1012
L1013
C1030
.8-4.5
C1032
.8-4.5
Q1004
2N2218
R1017
51
023
.40
C1039
0.1UF
C1035
1000
C1303
18
L1303
C1307
10
J1301
P2004
P2001
J2001
J2002
P2002
J1 PIN BPA1
ANTENNA
TO RECEIVER INPUT
P2003
J2003
ANTENNA RELAY
K2005
E TONE AMPLIFIER
20V CONTINUOUS
+20V TRANSMIT MODE
R1527
910 1/2W
T1504
R1523
3.9K
C1511
.0022UF
Q1502
2N697
Q1503
2N697
R1522
3.9K
R1524
620
C1512
1.0UF
R1525
300
C1513
.33UF
R1526
24
R1528
5.1
CR1505
IN252
R1404
330K
C1401
5UF
Q1401
2N338
CR1401
IN816
R1405
10K
R1406
100K
R1407
100
Q1402
2N338
C1402
.033UF
R1408
1.8K
1/2W
R1409
130
C1403
.068UF
R1410
1.5K
R1411
1.5K
CR1402
IN816
Q1403
2N697
Q1404
2N1132
C1404
22UF
C1405
.015UF
R1412
2.2K
R1413
2.2K
C1406
22UF
T1401
J1 PIN BP28
SIDE TONE
J1 PIN BP29
R1808
560 3W
PIN 6
S1902A
R1806
100K
Q1801
2N1552
R1809
5.6
3W
CR1804
G-100G
CR1805
G-100G
C1804
47UF
C1805
1.0UF
R1807
1K
1W
Q1802
2N1552
R1816
560
3W
R1810
5.6
3W
UNSUPPRESSED 27.5 VDC

NOTES

1. ALL RESISTORS ARE 1/4W 5% UNLESS OTHERWISE SPECIFIED.
2. ALL VALUES ARE IN OHMS, MICROMICROFARADS OR MICROHENRIES UNLESS OTHERWISE SPECIFIED.
3. NO CONNECTION.
4. CR1901 THRU CR1904 ARE IN676.
5. HIGH-LOW INFORMATION FROM R930 ON RECEIVER.
6. ROTORS ARE SHORTED TOGETHER
7. R1101, R1703 AND R1712 ARE TO BE SELECTED BY MANUFACTURER.
8. C1211, C1212 & C1213 ARE LOCATED ONE EACH PINS 2, 7 & 10 OF V1201. C1204 IS A LARGE THREE PLATE SCREEN BYPASS CAPACITOR. VALUE SHOWN IS APPROXIMATE.
9. CONNECTOR BETWEEN THE COMMON OF S1101 AND PINS 3, 6 & 11 OF V1201 IS WPN 27271-1.
10. C1108 TO BE SELECTED BY MFGR.

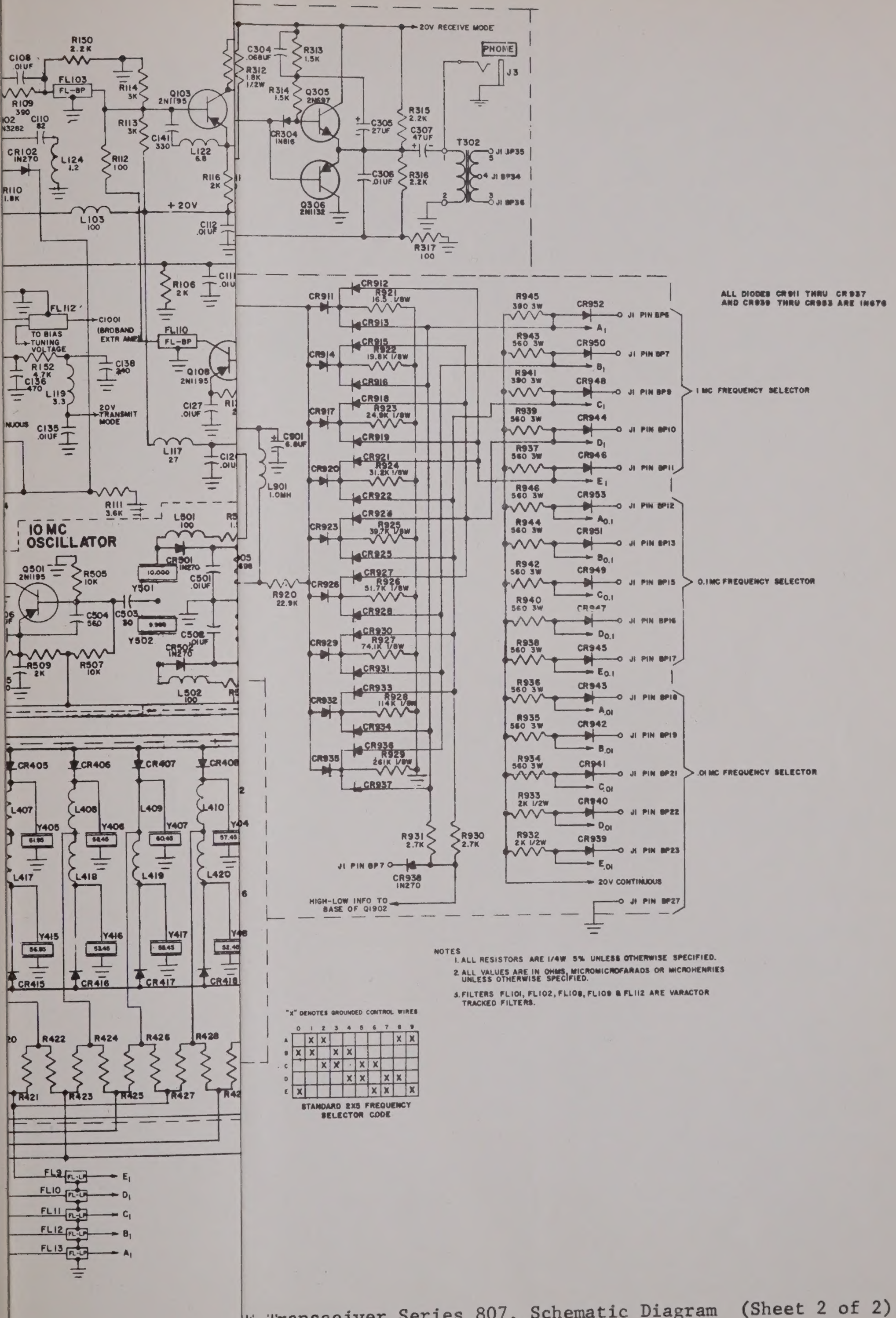
Transceiver Series 807, Schematic Diagram (Sheet 1 of 2)
Transmitter Circuits


BROADBAND EXCITER AMPLIFIER
DRIVER AMPLIFIER
POWER AMPLIFIER
HARMONIC FILTER & SIDETONE DETECTOR
TRANSMITTER AUDIO
MODULATOR
CHANNELING CONTROL
SIDE TONE AMPLIFIER
20V REGULATOR
HIGH VOLTAGE POWER SUPPLY
TRANSIENT SUPPRESSOR
PUSH TO TALK CONTROL
PANEL METER
FROM FL112
TO DRIVER SUPPLY
ANTENNA
TO RECEIVER INPUT
MIKE
10 MC FREQ SELECT
UNSUPPRESSED 27.5 VDC
PUSH TO TALK LINE
COMM DISABLE

NOTES

1. ALL RESISTORS ARE 1/4W 5% UNLESS OTHERWISE SPECIFIED.
2. ALL VALUES ARE IN OHMS, MICROMICROFARADS OR MICROHENRIES UNLESS OTHERWISE SPECIFIED.
3. NO CONNECTION.
4. CR1901 THRU CR1904 ARE 1N676.
5. HIGH-LOW INFORMATION FROM R930 ON RECEIVER.
6. ROTORS ARE SHORTED TOGETHER.
7. R1101, R1703 AND R1712 ARE TO BE SELECTED BY MANUFACTURER.
8. C1211, C1212 & C1213 ARE LOCATED ONE EACH PINS 2, 7 & 10 OF V1201. C1204 IS A LARGE THREE PLATE SCREEN BYPASS CAPACITOR VALUE SHOWN IS APPROXIMATE.
9. CONNECTOR BETWEEN THE COMMON OF S1101 AND PINS 3, 8 & 11 OF V1201 IS WPN 27271-1.
10. C1108 TO BE SELECTED BY MFGR.

Figure 7-1. VHF Transceiver Series 807, Schematic Diagram (Sheet 1 of 2) Transmitter Circuits


20V RECEIVE MODE
PHONE
J3
C304 .068UF
R313 1.5K
R312 1.8K 1/2W
R314 1.5K
Q305 2N697
CR304 1N816
C305 27UF
R315 2.2K
C307 47UF
T302
J1 BP35
J1 BP34
J1 BP36
Q306 2N1132
C306 .01UF
R316 2.2K
R317 100
R150 2.2K
C108 .01UF
FL103 FL-BP
R109 390
R114 3K
Q103 2N1195
C110 82
R113 3K
C141 330
L122 6.8
CR102 1N270
L124 1.2
R112 100
R116 2K
R110 1.8K
L103 100
+20V
C112 .01UF
R106 2K
C111 .01U
FL112
C1001 (BROADBAND EXTR AMP)
TO BIAS TUNING VOLTAGE
FL110 FL-BP
Q108 2N1195
R152 4.7K
C136 470
C138 240
L119 3.3
20V TRANSMIT MODE
C135 .01UF
C127 .01UF
L117 27
C901 6.8UF
L901 1.0MH
R111 3.6K
10 MC OSCILLATOR
Q501 2N1195
R505 10K
L501 100
CR901 1N270
Y501 10.000
C501 .01UF
C504 560
C503 30
Y502 9.990
C502 .01UF
CR502 1N270
R509 2K
R507 10K
L502 100
R920 22.9K
CR911
CR912
R921 16.5 1/8W
CR913
CR914
CR915
R922 19.8K 1/8W
CR916
CR917
CR918
R923 24.9K 1/8W
CR919
CR920
CR921
R924 31.2K 1/8W
CR922
CR923
CR924
R925 39.7K 1/8W
CR925
CR926
CR927
R926 51.7K 1/8W
CR928
CR929
CR930
R927 74.1K 1/8W
CR931
CR932
CR933
R928 114K 1/8W
CR934
CR935
CR936
R929 261K 1/8W
CR937
R931 2.7K
R930 2.7K
J1 PIN BP7
CR938 1N270
HIGH-LOW INFO TO BASE OF Q1902
R945 390 3W
CR952
J1 PIN BP6
A1
R943 560 3W
CR950
J1 PIN BP7
B1
R941 390 3W
CR948
J1 PIN BP9
C1
1 MC FREQUENCY SELECTOR
R939 560 3W
CR944
J1 PIN BP10
D1
R937 560 3W
CR946
J1 PIN BP11
E1
R946 560 3W
CR953
J1 PIN BP12
A0.1
R944 560 3W
CR951
J1 PIN BP13
B0.1
R942 560 3W
CR949
J1 PIN BP15
C0.1
0.1MC FREQUENCY SELECTOR
R940 560 3W
CR947
J1 PIN BP16
D0.1
R938 560 3W
CR945
J1 PIN BP17
E0.1
R936 560 3W
CR943
J1 PIN BP18
A.01
R935 560 3W
CR942
J1 PIN BP19
B.01
R934 560 3W
CR941
J1 PIN BP21
C.01
.01 MC FREQUENCY SELECTOR
R933 2K 1/2W
CR940
J1 PIN BP22
D.01
R932 2K 1/2W
CR939
J1 PIN BP23
E.01
20V CONTINUOUS
J1 PIN BP27
CR405
CR406
CR407
CR408
L407
L408
L409
L410
Y405 61.95
Y406 58.40
Y407 60.45
Y404 57.45
L417
L418
L419
L420
Y415 54.95
Y416 53.40
Y417 55.45
Y418 52.45
CR415
CR416
CR417
CR418
R422
R424
R426
R428
R421
R423
R425
R427
FL9 FL-LP E1
FL10 FL-LP D1
FL11 FL-LP C1
FL12 FL-LP B1
FL13 FL-LP A1

ALL DIODES CR911 THRU CR937 AND CR939 THRU CR953 ARE 1N676

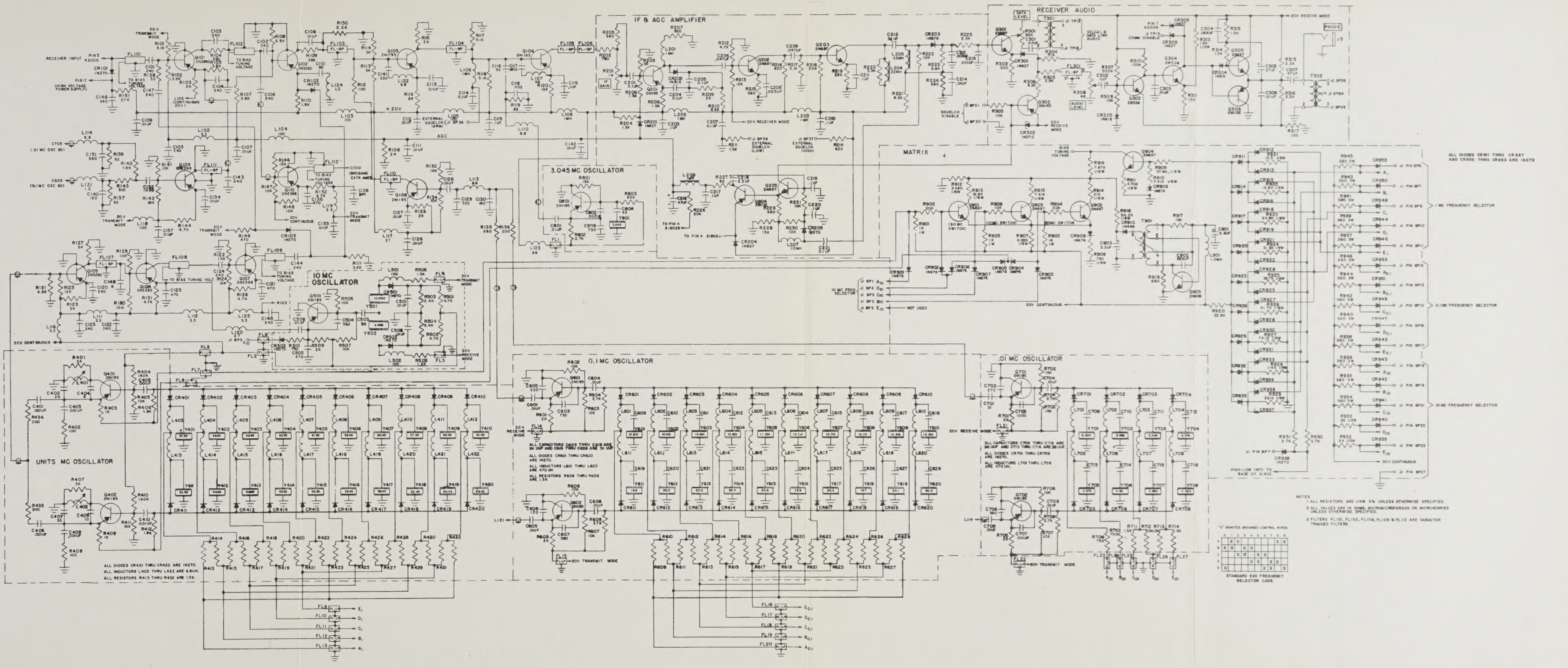
NOTES
1. ALL RESISTORS ARE 1/4W 5% UNLESS OTHERWISE SPECIFIED.
2. ALL VALUES ARE IN OHMS, MICROMICROFARADS OR MICROHENRIES UNLESS OTHERWISE SPECIFIED.
3. FILTERS FL101, FL102, FL108, FL109 & FL112 ARE VARACTOR TRACKED FILTERS.

"X" DENOTES GROUNDED CONTROL WIRES

	0	1	2	3	4	5	6	7	8	9
A		X	X						X	X
B	X	X		X	X					
C			X	X		X	X			
D					X	X		X	X	
E	X						X	X		X

STANDARD 2X5 FREQUENCY SELECTOR CODE

F Transceiver Series 807, Schematic Diagram (Sheet 2 of 2)
Receiver Circuits


IF & AGC AMPLIFIER
RECEIVER AUDIO
MATRIX
3.045 MC OSCILLATOR
10 MC OSCILLATOR
0.1 MC OSCILLATOR
.01 MC OSCILLATOR
UNITS MC OSCILLATOR
RECEIVER INPUT
20V TRANSMIT MODE
20V RECEIVE MODE
20V CONTINUOUS
1 MC FREQUENCY SELECTOR
0.1 MC FREQUENCY SELECTOR
.01 MC FREQUENCY SELECTOR
10 MC FREQ SELECTOR
HIGH-LOW INFO TO BASE OF Q1902
PHONE

ALL DIODES CR911 THRU CR937 AND CR938 THRU CR953 ARE IN676

ALL CAPACITORS C609 THRU C618 ARE 36 UUF AND C619 THRU C628 ARE 56 UUF

ALL DIODES CR601 THRU CR620 ARE IN270.

ALL INDUCTORS L601 THRU L620 ARE 470 UH

ALL RESISTORS R609 THRU R628 ARE 1.5K

ALL CAPACITORS C709 THRU C712 ARE 36 UUF AND C713 THRU C716 ARE 39 UUF.

ALL DIODES CR701 THRU CR708 ARE IN270.

ALL INDUCTORS L701 THRU L708 ARE 470 UH.

ALL DIODES CR401 THRU CR420 ARE IN270.

ALL INDUCTORS L403 THRU L422 ARE 6.8UH.

ALL RESISTORS R413 THRU R432 ARE 1.5K.

"X" DENOTES GROUNDED CONTROL WIRES

	0	1	2	3	4	5	6	7	8	9
A		X	X						X	X
B	X	X		X	X					
C			X	X		X	X			
D					X	X		X	X	
E	X						X	X		X

STANDARD 2X5 FREQUENCY SELECTOR CODE

NOTES

1. ALL RESISTORS ARE 1/4W 5% UNLESS OTHERWISE SPECIFIED.
2. ALL VALUES ARE IN OHMS, MICROMICROFARADS OR MICROHENRIES UNLESS OTHERWISE SPECIFIED.
3. FILTERS FL101, FL102, FL108, FL109 & FL112 ARE VARACTOR TRACKED FILTERS.

Figure 7-1. VHF Transceiver Series 807, Schematic Diagram (Sheet 2 of 2) Receiver Circuits

REVISION NOTICE NO. 104957 - REV 1.

ECN NO. 19368

- November 6, 1964 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 59 and up (Type 97607-100):

Change Parts List as follows:

Page 6-31 -- C609 and C610 now 33 uuf; Wilcox Part No. 17378-3.

Page 6-32 -- C611 thru C618 now 33 uuf; Wilcox Part No. 17378-3. C619 through C628 now 51 uuf; Wilcox Part No. 17313-3.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 2 of 2 -- Refer to notations below transistor Q601. C609 through C618 now 33 uuf. C619 through C628 now 51 uuf.

REVISION NOTICE NO. 104957 - REV 2.

ECN NO. 19422

- November 9, 1964 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers Serial No's 166 and up (Type 97607-100):

Change Parts List as follows:

Page 6-54 -- R229 now 1000 ohms; Wilcox Part No. 849560-1.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 2 of 2 -- R229 now 1000 ohms.

REVISION NOTICE NO. 104957 - REV 3.

ECN NO. 19595

- December 23, 1964 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 202 and up (Type 97607-100):

Change text as follows:

Page 4-17, par. 4-71 -- Change line four to read --- its collector current flows through resistors R915, R947, and R912 to ground. The resultant ---

Page 4-17, par. 4-72 -- Change line four to read --- and its collector current flows through resistors R914, R947, and R912 to ground. The re- ---

Page 4-18, par. 4-73 -- Change line one to read --- and its collector current flows through resistors R913, R947, and R912 to ground. The ---

Page 4-18, par. 4-74 -- Change lines six and seven to read --- CR902. With all three transistor switches turned off, only series resistors R916, R947, and R912 remain to load the collector circuit of the unit's amplifier.

Page 4-30, par. 4-129 -- Insert the following sentence after line six --- As further insurance against oscillations, FL101 is intentionally detuned by the application of a reduced level of bias voltage that is obtained from the junction of resistors R912 and R947 and fed through contacts 3 and 4 of bias tuning control relay K101.

Page 4-35, par. 4-163 -- Change paragraph 4-163 to read as follows: 4-163. During the receive mode of operation, power control relay K2002, antenna relay K2005, and bias tuning control relay K101 are de-energized. Contacts on relay K2002 then apply the output of the +20-volt dc regulator to receiver stages that are operative only during reception. Contacts on relay K2005 connect the communications antenna to the receiver input. Contacts on relay K101 connect the full bias tuning voltage to tracked filter FL101.

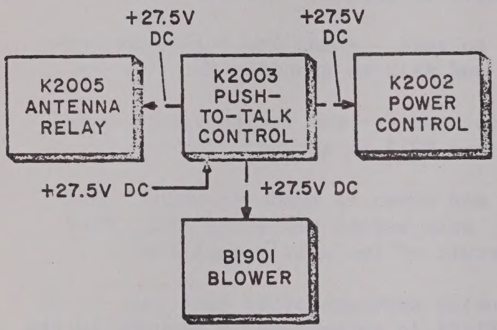
Page 4-35, par. 4-164 -- Change line five to read --- trol relay K2002, antenna relay K2005, and bias tuning control relay K101 and start transmitter blower B1901. Con- --- Add the following sentence at end of paragraph: Contacts of energized relay K101 apply the reduced bias tuning voltage to tracked filter FL101.

Page 4-41, par. 4-189 -- Change lines 10 through 13 to read --- provide muting for a companion communications receiver. Contacts 3 and 4 apply +27.5 volts dc to the coils of power control relay K2002, antenna relay K2005, bias tuning control relay K101, and blower motor B1901.

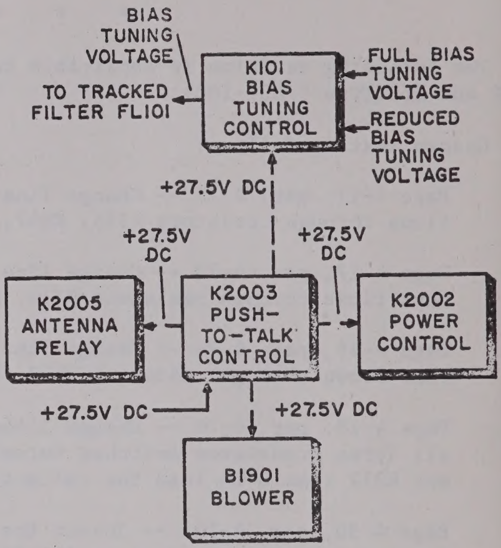
Page 4-41, par. 4-191.1 -- Insert the following paragraph after paragraph 4-191: 4-191.1. When bias tuning control relay K101 is energized, a reduced level of bias voltage (from the junction of resistors R912 and R947) is applied to filter FL101 via contacts 3 and 4 of relay K101.

Change block diagrams as follows:

Page 4-36, Figure 4-4 --


+27.5V DC
+27.5V DC
K2005 ANTENNA RELAY
K2003 PUSH-TO-TALK CONTROL
K2002 POWER CONTROL
+27.5V DC
+27.5V DC
B1901 BLOWER

Now Shows


BIAS TUNING VOLTAGE
TO TRACKED FILTER FL101
K101 BIAS TUNING CONTROL
FULL BIAS TUNING VOLTAGE
REDUCED BIAS TUNING VOLTAGE
+27.5V DC
+27.5V DC
+27.5V DC
K2005 ANTENNA RELAY
K2003 PUSH-TO-TALK CONTROL
K2002 POWER CONTROL
+27.5V DC
+27.5V DC
B1901 BLOWER

Change to Show

Change printed circuit board drawings as follows:

Page 5-38, Figure 5-14 (Sheet 8) -- Show added resistor R947 on underside of board, and connect R947 between upper solder point for R915 and lower solder point for R912.

Change Parts List as follows:

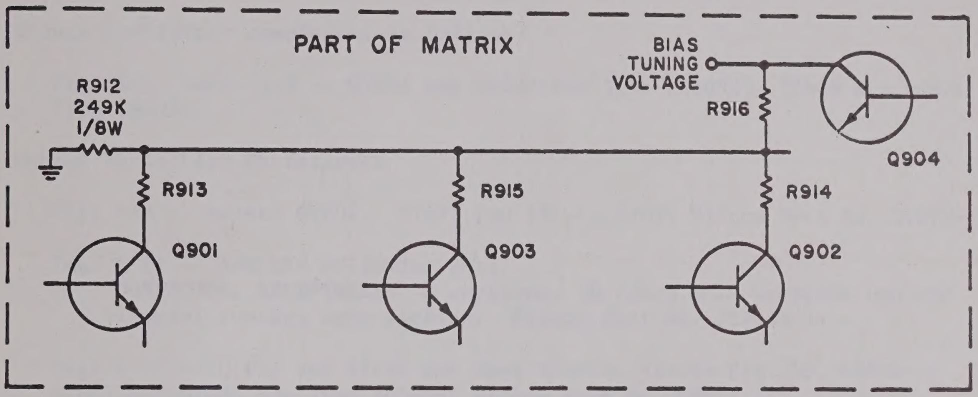
Page 6-42 -- Add the following part:
K101 RELAY, ARMATURE: DPDT; coil 675 ohms; 26 vdc. Wilcox Part No. 12196-1.

Page 6-60 -- R912 now 130,000 ohms; Wilcox Part No. 853559-1.

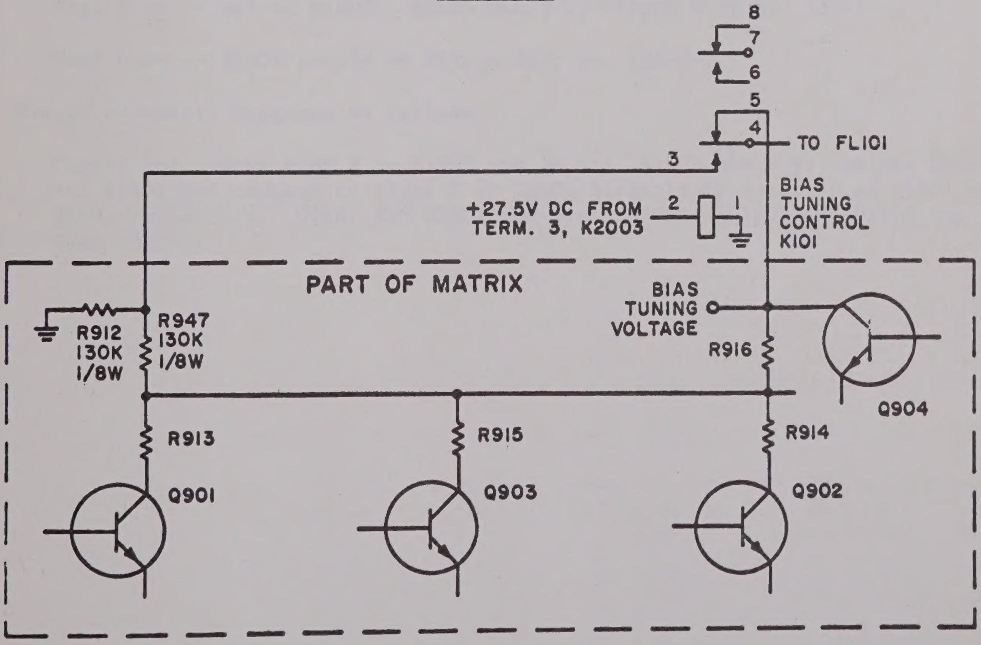
Page 6-61 -- Add the following part:
R947 RESISTOR, FIXED, FILM: 130,000 ohms, ±1%; 1/8 w.
Wilcox Part No. 853559-1.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 2 of 2 -- Change notation on bias terminal of filter FL101 to read --- TO BIAS TUNING VOLTAGE (TERM. 4, K101) --- Change bias tuning matrix circuit as follows:


PART OF MATRIX
BIAS TUNING VOLTAGE
R912
249K
1/8W
R916
Q904
R913
R915
R914
Q901
Q903
Q902

Now Shows


8
7
6
5
4
TO FL101
3
+27.5V DC FROM TERM. 3, K2003
2
1
BIAS TUNING CONTROL K101
PART OF MATRIX
BIAS TUNING VOLTAGE
R912
130K
1/8W
R947
130K
1/8W
R916
Q904
R913
R915
R914
Q901
Q903
Q902

Change to Show

REVISION NOTICE NO. 104957 - REV 4.

ECN NO. 19254

- December 24, 1964 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 216 and up (Type 97607-100):

Change transistor complement as follows:

Page 1-5, Table 1-3 -- Q1601 and Q1602 now Type 2N3053. Q1603 and Q1604 now Type 2N3055.

Change Parts List as follows:

Page 6-8 -- Delete C1601. C1801 now 18 uf, ±20%; Wilcox Part No. 21279-1.

Page 6-11 -- Add the following part:
J1 CONNECTOR, RECEPTACLE: 2 sections; 39 round male contacts and one coaxial contact each section. Wilcox Part No. 229633-1.

Page 6-17 -- Q1601 and Q1602 now Type 2N3053; Wilcox Part No. 48630-1. Q1603 and Q1604 now Type 2N3055; Wilcox Part No. 48631-1.

Page 6-21 -- Delete R1602. R1605 now 3 w; Wilcox Part No. 51014-1.

Page 6-24 -- S1902 should be Wilcox Part No. 10852-2.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 1 of 2 -- C1801 now 18 uf. R1605 now 3 w. Delete C1601 and R1602 and connect terminal 2 of T1601 directly to junction of Q1601 and Q1602 collectors. Q1601 and Q1602 now Type 2N3053. Q1603 and Q1604 now Type 2N3055.

REVISION NOTICE NO. 104957 - REV 5.

ECN NO'S. 19354 and 19566

- January 26, 1965 -

*   *   *   *   *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 241 and up (Type 97607-100):

Change transistor complement as follows:

Page 1-3, Table 1-3 -- Q101, Q102, and Q105 through Q108 now Type 2N3283. Q104 now Type 2N3323.

Page 1-4, Table 1-3 -- Q501, Q601, Q701, Q801, and Q702 now Type 2N3323. Q905 now Type 2N3053. Q109 and Q602 now Type 2N3283.

Page 1-5, Table 1-3 -- Q1706 now Type 2N697.

Change photographs as follows:

Page 2-7, Figure 2-6 -- Change transistor designation from Q1701 to Q1704.

Change Parts List as follows:

Page 6-17 -- Q1706 now Type 2N697; Wilcox Part No. 48513-1.

Page 6-29 -- C212 and C214 now:
CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw. Wilcox Part No. 19407-1.

Page 6-30 -- C303 and C306 now:
CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw. Wilcox Part No. 19407-1.

Page 6-31 -- C501, C502, C506, C601, C604, C605, and C608 now:
CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw. Wilcox Part No. 19407-1.

Page 6-32 -- C704 now:
CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw. Wilcox Part No. 19407-1.

Page 6-33 -- C705, C708, and C801 now:
CAPACITOR, FIXED, PLASTIC: 0.01 uf, ±20%; 80 vdcw. Wilcox Part No. 19407-1.

Page 6-34 -- CR103 now: silicon; Type 1N627. Wilcox Part No. 46104-1.

Page 6-48 -- Q101, Q102, and Q105 through Q109 now Type 2N3283; Wilcox Part No. 48633-1. Q104 now Type 2N3323; Wilcox Part No. 48634-1.

Page 6-50 -- Q501, Q601, Q701, Q702, and Q801 now Type 2N3323; Wilcox Part No. 48634-1. Q602 now Type 2N3283; Wilcox Part No. 48633-1. Q905 now Type 2N3053; Wilcox Part No. 48630-1.

Page 6-53 -- R210 now 7500 ohms; Wilcox Part No. 849592-1.

Page 6-55 -- R404 and R410 now 10,000 ohms; Wilcox Part No. 849596-1.

(over)

Page 6-57 -- R505, R602, and R606 now 15,000 ohms; Wilcox Part No. 849602-1. R507, R603, and R607 now 82,000 ohms; Wilcox Part No. 849629-1. R509, R601, and R605 now 2700 ohms; Wilcox Part No. 849575-1. R510 now 360 ohms; Wilcox Part No. 849544-1.

Page 6-58 -- R701 and R705 now 2700 ohms; Wilcox Part No. 849575-1. R702 and R706 now 15,000 ohms; Wilcox Part No. 849602-1. R703 and R707 now 82,000 ohms; Wilcox Part No. 849629-1.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 1 of 2 -- Q1706 now Type 2N697.

Figure 7-1, Sheet 2 of 2 -- CR103 now Type 1N627. Change diode designations as follows: from CR953 to CR945; from CR951 to CR947; from CR947 to CR951; from CR945 to CR953; from CR943 to CR939; from CR942 to CR940; from CR940 to CR942; and from CR939 to CR943. Q101, Q102, Q105 thru Q109, and Q602 now Type 2N3283. Q104, Q501, Q601, Q701, Q702, and Q801 now Type 2N3323. Q905 now Type 2N3053. R210 now 7500 ohms. R404 and R410 now 10,000 ohms. R505, R602, R606, R702, and R706 now 15,000 ohms. R507, R603, R607, R703, and R707 now 82,000 ohms. R509, R601, R605, R701, and R705 now 2700 ohms. R510 now 360 ohms. Change resistor designations as follows: from R946 to R938; from R944 to R940; from R940 to R944; and from R938 to R946. Change resistor designations and values as follows: from R936 and 560 ohms to R932 and 2000 ohms; from R935 and 560 ohms to R933 and 2000 ohms; from R933 and 2000 ohms to R935 and 560 ohms; from R932 and 2000 ohms to R936 and 560 ohms.

REVISION NOTICE NO. 104957 - REV 6.

ECN NO. 19518

- February 8, 1965 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 266 and up (Type 97607-100):

Change transistor complement as follows:

Page 1-4, Table 1-3 -- Q1101 now Type 2N3664.

Change Parts List as follows:

Page 6-16 -- Q1101 now Type 2N3664; Wilcox Part No. 48639-1.

Change Schematic Diagrams as follows:

Figure 7-1, Sheet 1 of 2 -- Q1101 now Type 2N3664.

REVISION NOTICE NO. 104957 - REV 7.

ECN NO. 19803

- March 17, 1965 -

*   *   *   *   *

The following revision is applicable to all Series 807 VHF Transceivers and all Instruction Manuals should be changed as follows:

Paragraph 5-13(f), Page 5-6: Change sentence to read, " *** indicate approximately 20 volts."

Paragraph 5-13(g), Page 5-6: Delete this paragraph and substitute new paragraph reading, "g. Factory setting of REG VOLT control, R1714, should not be changed until power output test, paragraph 5-15(q) has been performed."

Paragraph 5-15(q), Page 5-8: Insert the following new paragraph after sub-paragraph (3): "r. Minimum power outputs should appear in the 120 mc and 142-145 mc regions. If the minimum power output is below 25 watts, adjust REG VOLT control R1714, figure 5-6, between the limits of 19.5 to 21 volts until the power output increases to 25 watts. Do not adjust for maximum power output on these channels. Check the entire band to determine that all channels are still above the 25 watt minimum. The correct setting of the REG VOLT control, R1714, will produce the smallest spread between maximum and minimum output."

Paragraph 5-15(r), Page 5-8: Change the paragraph number of this paragraph from "r" to "s".

Paragraph 5-37, Page 5-17: Delete this paragraph in its entirety.

Table 5-2, Page 5-9: Change this table as shown on the reverse side of this sheet.

(over)

TABLE I. TYPICAL METER INDICATIONS

POSITION SWITCH S1902	TYPICAL INDICATION METER M1
OFF	Open circuit.
LINE V	27 volts, approximate.
REG SUP	20 volts.
AGC	*No signal applied: 0.05 (1 scale div); signal applied: 0.05 (1 scale div) to 0.80 (16 scale div), depending upon level of input signal.
MOD I	**3.5 amperes maximum; 2.0 to 2.5 amperes typical.
DRIVER V	***33 volts, ±15 per cent.
DRIVER I	***Depends on frequency of operation; 60 ma minimum; 500 ma maximum; 150 to 300 ma typical.
PA GRID I	***Depends on frequency of operation; zero ma minimum; 40 ma maximum; 15 to 25 ma typical.
PA B+	***400 volts, ±15 per cent.
PA CATH I	***Depends on frequency of operation; 300 ma maximum; 150 to 200 ma typical.
PWR OUT	***25 watts minimum; (unmodulated).

*Meter scale for AGC position of switch S1902 is an uncalibrated indication of AGC action (not voltage or current).

**Microphone PTT button depressed and speaking into microphone in a normal voice.

***Test panel PTT switch S1 set to ON.

R

REVISION NOTICE NO. 104957 - REV 8.

ECN NO. 19337

- July 30, 1965 -

* * * * *

The following revision is applicable to Series 807 VHF Transceivers, Serial No's 326 and up (Type 97607-100):

Change Parts List as follows:

Page 6-5 -- C1204 now 4000 uuf, +40% -20%; 500 vdcw. Wilcox Part No. 17483-1.

REVISION NOTICE NO. 104957 - REV 9.

ECN'S 19587, 19616, 19646, 19696, 19733

- July 30, 1965 -

* * * * *

The following revisions are applicable to Series 807 VHF Transceivers, Serial No's 326 and up (Type 97607-100):

Change transistor complement as follows:

Page 1-3, Table 1-3 -- Q103 now type 2N3283, Q203 now type 2N2218.

Page 1-4, Table 1-3 -- Q904 now type 2N1711.

Change text as follows:

Page 4-13, paragraph 4-50 -- Delete in line seven the sentence that reads -- Capacitor C117 and coil L107 form a tuned circuit resonant at 455 kc.

Page 4-13, paragraph 4-51 -- Change line twelve to read --- Coil L106, connected to the emitter of ---.

Page 4-19, paragraph 4-88 -- Change line three to read --- The collector of transistor Q205 to pin 30 --- Change line six and seven to read --- a ground to be applied to pin 30, ---.

Page 4-19, paragraph 4-89 -- Change the first line to read --- Coil L106 is connected from the emitter of the third mixer ---.

Page 4-37, and Page 4-38, paragraph 4-169 -- Delete the sentence of line ten, eleven and twelve that reads --- A Zener diode (CR1708) and two temperature-compensating diodes (CR1706 and CR1707) form a series network from the emitter of transistor Q1706 to ground. Change line twelve of page 4-37 and line one of page 4-38 to read -- The Zener diode (CR1708) connected in the emitter circuit of Q1706 is used as a reference ---.

Change printed circuit board drawings as follows:

Page 5-34, Figure 5-14 (Sheet 4) -- Show added resistor R232 on the underside of the board and connected between the two solder terminal of R211.

Page 5-37, Figure 5-14 (Sheet 7) -- Delete diodes CR1706 and CR1707. Show a jumper wire from the cathode solder terminal of CR1707 to the anode solder terminal of CR1706 on the printed circuit board. Relocate R1403 to be inline with R1901 instead of R1903.

Page 5-38, Figure 5-14 (Sheet 8) -- Remove the cathode band from CR908. Change CR908 to read R948.

Change parts list as follows:

Page 6-6 -- C1401 now: CAPACITOR, FIXED, MYLAR: .033uf, ±20%; 50vdcw. Wilcox Part No. 19365-1.

Page 6-10 -- Delete CR1706 and CR1707.

Page 6-14 -- Add the following part: L1212, CHOKE, RADIO FREQUENCY: 2.7uh, ±10%, at 7.9 mc; 0.8 amp dc; 0.15 ohms. Wilcox Part No. 38952-14.

Page 6-22 -- R1713 now 360 ohms; Wilcox Part No. 861245-1.

Page 6-27 -- Delete C117.

Page 6-28 -- Add the following part: C149, CAPACITOR, FIXED MYLAR; .068uf, ±10%; 50 vdcw. Wilcox Part No. 19383-2.

Page 6-33 -- Change C709 through C712 to 33uuf; Wilcox Part No. 17313-3 and C713 through C716 to 36uuf; Wilcox Part No. 17366-3.

Page 6-38 -- Delete CR908.

Page 6-43 -- Delete L107.

Page 6-44 -- Add the following part: L126, CHOKE, RADIO FREQUENCY: 2.7uh, ±10% at 7.9mc; 800ma dc; 0.15 ohms Wilcox Part No. 38952-14.

Page 6-48 -- Q103 now type 2N3283; Wilcox Part No. 48633-1.

Page 6-49 -- Q203 now type 2N2218; Wilcox Part No. 48576-1.

Page 6-50 -- Q904 now type 2N1711; Wilcox Part No. 48637-1.

Page 6-51 -- R103 and R110 now 1100 ohms; Wilcox Part No. 849562-1. R113 now 1500 ohms; Wilcox Part No. 849566-1. R114 and R117 now 15,000 ohms; Wilcox Part No. 849602-1. R115 now 10,000 ohms; Wilcox Part No. 849596-1. R116 now 16,000 ohms; Wilcox Part No. 849604-1. R118 now 2700 ohms; Wilcox Part No. 849575-1.

Page 6-53 -- R150 now 15,000 ohms; Wilcox Part No. 849602-1. R211 now 39,000 ohms; Wilcox Part No. 849617-1. R214 now 2000 ohms; Wilcox Part No. 849571-1.

Page 6-54 -- Add the following part: R232, RESISTOR, FIXED COMPOSITION: 620,000 ohms ±5%, 1/4 w. Wilcox Part No. 849661-1.

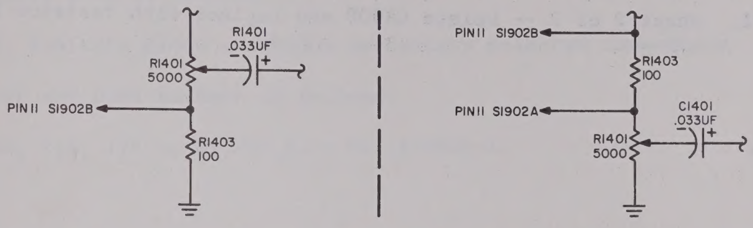
Page 6-60 -- R911 now 5110 ohms; Wilcox Part No. 853556-1. R915 now 7150 ohms; Wilcox Part No. 853566-1. R921 now 15,000 ohms; Wilcox Part No. 853563-1.

Page 6-61 -- Add the following part: R948, RESISTOR, FIXED COMPOSITION: 100 ohms, ±5%, 1/4 w. Wilcox Part No. 849524-1.

REVISION NOTICE 104957 - REV 9 (Cont)

Change Schematic Diagram as follows:

Figure 7-1, Sheet 1 of 2 -- C1401 now .033uf. R1713 now 360 ohms. Delete CR1706 and CR1707, show anode of CR1702 reconnected to the base of Q1701. Delete the ground connection from pin 11 of S1902A (front). Add new part, L1212, (2.7uh) in parallel with capacitors C1208 and C1209 in the output circuitry of the power amplifier, V1201. Change the circuitry of the sidetone amplifier as shown below;



NOW SHOWS

CHANGE TO SHOW

Figure 7-1, Sheet 2 of 2 -- R103 and R110 now 1.1K. R113, R114 and R117 now 15K. R116 now 16K. R118 now 2.7K. R211 now 39K. R214 now 2K. R911 now 5.11K. R915 now 7.15K. R921 now 15K. Q103 now type 2N3283. Q203 now type 2N2218. Q904 now type 2N1711. CR103 now type 1N270.

Figure 7-1, Sheet 2 of 2 -- In the base circuitry of the RF Amplifier Q101, add inductor L126, 2.7 uh, (new part) in the bias tuning voltage line to filter FL101.

Figure 7-1, Sheet 2 of 2 -- Change notation on the circuitry of the first mixer Q102, as follows: R150, 2.2K to read R115, 10K.

Figure 7-1, Sheet 2 of 2 -- On the collector of the second mixer Q103, delete resistor R115. Show inductor L122 disconnected from the emitter of Q103 and reconnected to ground.

Figure 7-1, Sheet 2 of 2 -- Delete L107 and C117 from the circuitry of the third mixer Q104. Add resistor R150, 15K, between the collector of Q104 and ground. Show L106 disconnected from the base circuitry of Q104 and reconnected to the emitter of Q104.

Figure 7-1, Sheet 2 of 2 -- On the circuitry of the first injection amplifier Q107, show added capacitor C149, .068uf, (new part) between ground and the bias tuning voltage line of filter FL109.

Figure 7-1, Sheet 2 of 2 -- On the external squelch circuitry show resistor R232, 620K, (new part) added in parallel with R211. Add the following notation directely below resistor R211: "SEE NOTE 4".

Figure 7-1, Sheet 2 of 2 -- Add note 4 directly below note 3 as follows: "4. R211 AND R232 TO BE SELECTED FOR DESIRED'EXTERNAL SQUELCH CONTROL' LIMITS."

Figure 7-1, Sheet 2 of 2 -- Change notation on the .01 mc Oscillator circuitry to read as follows: ALL CAPACITORS C709 THRU C712 ARE 33UUF AND C713 THRU C716 ARE 36UUF.

Figure 7-1, Sheet 2 of 2 -- Change the notation of Squelch Disable circuitry as follows: J1BP30 to J1BP31 and J1BP31 to J1BP30.

Figure 7-1, Sheet 2 of 2 -- Delete CR908 and replace with resistor R948 (100 ohms).

REVISION NOTICE NO. 104957 - REV 10.

ECN NO. 19838

- July 30, 1965 -

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The following revision is applicable to all Series 807 VHF Transceivers:

Change the Parts List as follows:

Page 6-22, Indicate R1801 and R1802 as factory selected components.

Typical values and part numbers as follows:

R1801, 22K, ±5%; 1/4 w. Wilcox Part No. 849608-1.

or

R1801, 18K, ±5%; 1/4 w. Wilcox Part No. 849605-1.

R1802, 220 ohms, ±5%; 1 w. Wilcox Part No. 851170.

or

R1802, 180 ohms ±5%; 1 w. Wilcox Part No. 851173.

Change the schematic diagrams as follows:

Figure 7-1, Sheet 1 of 2 -- Add note eleven as follows: "11. R1801 AND R1802 TO BE SELECTED BY MFR."

REVISION NOTICE NO. 104957 - REV 11.

ECN NO. 19869

- July 30, 1965 -

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The following revision is applicable to Series 807 VHF transceivers, Serial No's 350 and up (Type 97607-100):

Change the Parts List as follows:

Page 6-10 -- Delete CR1711 and add the following part:
CR1712 SEMICONDUCTOR DEVICE, DIODE: silicon, Type 1N676. Wilcox Part No. 46204-1.

Page 6-22 -- Add the following part:
R1717, RESISTOR, FIXED, COMPOSITION: 2 ohms; 2 w. Wilcox Part No. 51049-1.

Page 6-33 -- Change C804 to read:
C804, CAPACITOR, FIXED, MICA: 39uuf, ±2%; 100 vdcw. Wilcox Part No. 17367-3.

Correct the schematic diagrams as follows:

Figure 7-1, Sheet 1 of 2 -- C804 now 39uuf. Delete diode CR1711 in the emitter circuitry of Q1704 and add in the place of CR1711 resistor R1717, 2 ohms (new part). Show added diode CR1712 with the cathode connected to the emitter of transistor Q1702 and the anode connected to the base of Q1705 in the circuitry of the +20V Regulator.